

**THE CARE OF CHILDREN
IN THE TROPICS**



PROPER METHOD OF HOLDING A BABY DURING NURSING.
The mother is seated on a low nursing chair with her right foot raised on a
low stool.

(From Hess's *Infant Feeding*, by kind permission.)

[Frontispiece.]

THE CARE OF CHILDREN IN THE TROPICS IN HEALTH AND DISEASE

*A Practical Guide for Mothers, Nurses, and
Junior Practitioners of Medicine*

By

ERIC C. SPAAR, B.A., M.D., B.S.(LOND.) M.R.C.P.

FELLOW OF THE ROYAL SOCIETY OF MEDICINE; PHYSICIAN, GENERAL
HOSPITAL, COLOMBO; LATE PHYSICIAN, CHILDREN'S FEVER
HOSPITAL, HAMPSTEAD, LONDON; CLINICAL ASSISTANT
GREAT ORMOND STREET HOSPITAL FOR SICK
CHILDREN, LONDON; AND LECTURER ON
DISEASES OF CHILDREN AT THE
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PREFACE

THE writing of this book was undertaken owing to the long-felt want of a manual dealing with just those little problems in a child's upbringing, which are a source of worry to the young and inexperienced mother in the Tropics. Every effort has been made at the same time to meet the needs of the General Practitioner, who may find himself in difficulties when confronted by the changed aspects of illness in children, and has to dive deep and wide into the literature of the subject for information not found in the ordinary text-book. Consequently, a large part of the book is devoted to the correct principles of feeding in infancy, as well as to the detection and overcoming of those errors which are the cause of so many of a child's ailments.

The method of feeding with cow's milk by simple dilution with the addition of sugar, which is being largely advocated at the present day, is only recommended after the second month. In practice, a greater dilution will often be found necessary, and is certainly safer, in the first two months, and a simple scheme of feeding has been drawn up for that period.

The use of dried milk in infant-feeding, which is largely replacing the natural cow's milk in the Tropics,

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CARE OF CHILDREN IN THE TROPICS.

PART I

THE GENERAL MANAGEMENT OF THE INFANT

FOREWORD

It is a well-known fact that the infant mortality in a tropical climate like Ceylon is very high as compared with that of Europe or America.

The following statistics furnished by the Registrar-General for the five years ending in 1927, gives convincing proof of the appalling death rate in infants under one year in the island of Ceylon:—

Year.	Births.	Deaths under 1 year	Death over 1 year and under 2 years.
1923	181,437	38,467	7,973
1924	178,807	33,358	6,830
1925	193,261	33,221	5,963
1926	206,888	36,024	7,273
1927	205,469	32,958	6,727

From these figures, it will be seen that on the average one out of every five babies born, dies within one year. In the second year the death-rate is one-fifth that of the first year. As compared with London, the mortality of infants under one year is twice as great.

On this account the belief has arisen that infants, especially those of European parentage, cannot thrive in tropical countries, and do not grow up healthy and strong. This belief does not contain more than a germ of truth, however, and should not be given credence to, for, although it is true that disorders of the digestive tract which would not be of much consequence in a cold climate, are more likely to be attended by complications in a hot country, the great majority of the illnesses that injure health or cause death are due to bad hygienic surroundings, mismanagement, and utter ignorance of the simplest duties of motherhood by its members.

Practically, it is the first three months and the teething period that ordinarily give more trouble, but as an offset against climatic conditions must be placed the knowledge that diseases like measles and whooping-cough, which claim so many victims among infants in cold climates, are so mild in the Tropics as not to cause any anxiety at all, while diphtheria is rare, and scarlet fever unknown. Consequently, it may be stated without fear of contradiction that even in the case of European children, a change to a temperate climate is by no means essential, before the age of five years at any rate.

To give knowledge and simple direction to those who need it, whereby children may be brought up from the cradle to enjoy vigorous health, is the object of this Manual.

CHAPTER I

THE NEW-BORN BABE

A CAREFUL inspection of the newly-born infant should always be made at once to discover any defects that may be present. Then, after it has been washed and dressed, it should preferably be placed in a crib by itself where it will soon fall asleep. It should not be awakened unless to change diapers; but at the end of from eight to twelve hours after the termination of labour, that is, after the mother has had her first sleep, it should be put to the breast and be made to take from each for three minutes. Longer delay would be injurious to both mother and child: to the mother, because this stimulus to the secretion of milk and the contraction of her womb will be lacking; to the infant, because it is deprived of the first milk which has important properties of its own.

During the rest of the first twenty-four hours of its life, the infant should be put to both breasts three or four times at intervals of four hours, in order to further stimulate the secretion of milk and teach it how to nurse. This four-hourly taking of the breast should be continued during the second twenty-four hours, the time at each breast being lengthened to five minutes,

and right on even up to the end of the fourth day, if the proper milk flow is so long delayed as may sometimes happen in the case of anxious mothers with first babies. The sixth feed at night may well be omitted, however, in order that the mother may have more rest, but at all other times and during the whole of the nursing period, it cannot be too strongly emphasized that the infant should be fed by the clock and *must be awakened to be fed*, in order that regular habits may be cultivated, which are so necessary for the physical and mental well-being of the mother and are of as great importance to the child.

The first milk secreted by the breast after delivery is watery and of a yellow colour and is known as *colostrum*. It has long been supposed to have aperient properties, but we have only recently discovered that it is of very great importance in protecting the infant from the attacks of micro-organisms, to which it has now become liable by its entrance into the world as a free-living individual. Hence it is most desirable that the baby should not be deprived of this all-important first milk, even if the mother has decided to refrain from nursing it or for some reason is unable to do so. By its aperient properties, the colostrum cleanses the infant's bowels of the dark greenish-brown matter contained in them at the time of birth, and known as meconium.

On the first two days, and before the flow of milk has been established, it is a good routine to administer some liquid to the baby, since it is parting with fluid

by the kidneys, the skin, and the lungs. This may take the form of plain boiled water or anise tea,* a teaspoonful at a time. This should be given soon after the breast has been taken and not in the intervals. Your great desire on these first days is to make the breasts secrete, and this is best secured by vigorous sucking on the part of the baby. If its thirst is otherwise satisfied the stimulus of sucking will be applied less strongly.



Early Abnormal Findings in the Newborn

Careful observation must be made of the first passage of urine by the new-born babe. If no urine is voided for several hours, the fact must be mentioned to the doctor (see also, Urine, absence of, in Part III, Chap. III).

Again two or three days after birth a yellow coloration of the skin and eyes may be noticed, and the napkins may be stained by the urine. This is not really abnormal in most cases, but see Jaundice, in Part III, Chap. III.

* Anise tea is made by soaking two heaped tablespoonfuls of the seed in a cup of hot water for a quarter of an hour and straining.

CHAPTER II

THE NURSING PROPER

Breast-feeding.—Mother's milk is unquestionably the ideal food for a baby in spite of the fact that there are many good artificial infant's foods on the market on which a baby often does well. For that reason the public to-day, aided by advertisements in the lay press, the opinions of their friends, and the slightest disorder in the infant, arising from a non-observance on the part of a mother of the correct principles of nursing, believe that these are quite as good as, if not better than, breast-feeding,

But, if any proof were needed of the great superiority of mother's milk over that of any and every kind of bottle-feeding, it will suffice to say that it has been found that where breast-feeding has been customary, even in the overcrowded and poverty-stricken districts of the large cities of Great Britain and America, the infant mortality is lower than elsewhere in spite of the insanitary conditions prevailing, for fully four-fifths of the deaths under one year are infants who are artificially fed (Holt).

McClanahan writing in the *Archiv. Pediat.* of 1918, has summarized the great advantages of breast-feeding, as gathered from the opinions of a large number of

pediatricians whom he consulted with regard to the evidences of ill-health among breast- and bottle-fed infants, by concluding: *Breast-fed infants are less susceptible to infection and resist infection to better advantage and with less after-effect from the disease. Breast-fed infants have less morbidity than bottle-fed infants even when properly fed.*

An equally important and most decisive factor in the choice of breast-feeding is the opportunity given to the mother to understand her infant's wants, to learn to appreciate its feelings, and to notice the first signs of illness, by the close contact thus brought about between the two.

If mothers who go into Society and are fond of sport will give careful heed to the above observations, the following remark, heard by the author in the early days of his practice, will only rarely be made by husbands: "I cannot hear of it; my wife cannot remain in the house all day long;" nor will the false opinion be engendered and encouraged that the modern woman has lost the ability to suckle her young—a trend of thought which is very disconcerting, as regards the women of the future.

Fortunately, most mothers are quite keen on nursing their babies.

Regular nursing may be said to begin on the third or fourth day when the flow of the mother's milk has become established. From the time this natural nourishment has begun and is found sufficient, the child should depend on that entirely till it has begun to cut

some of its teeth, *i.e.*, till it is about six months old at the earliest. Should the mother's milk be delayed beyond the third day, it is permissible in certain cases to give a couple of teaspoonfuls of diluted fresh cow's milk or Nestle's Ideal milk three or four times in the twenty-four hours soon after the nursing, with due regard to times of feeding as previously described.

These feeds should be prepared as follows :

	Tablespoons full of milk.	Tablespoons full of boiled water.
Cow's milk	1	4
Nestle's Ideal milk	1	6

In each case the feed should be slightly sweetened with sugar of milk preferably, or the ordinary white loaf sugar. This must be regarded as merely tentative till the mother's breasts are able to function fully, and is only necessary if the water given as advised does not satisfy it and it seems restless and cries much, for a baby during these first few days is more thirsty than hungry. If, however, there is no flow of breast milk by the fifth day, artificial feeding must be begun. It must be strongly emphasized, however, that the supply of milk by the human breast depends on the demands to which it is put, and the best stimulus to the secretion of milk is its vigorous sucking by the baby at repeated and regular intervals, so that it is completely emptied on each occasion. If the stimulus is not applied and no demand is made, the supply of breast milk gradually fails till it becomes insufficient to meet the infant's needs. It is only very rarely that a mother's breasts

are so poorly developed as to necessitate a disregard of all attempts at nursing. In such a case the services of a wet nurse may be desirable (see Wet Nurse).

The Weight Curve.—A healthy baby generally weighs seven pounds and measures eighteen inches in length. Up to about the fifth day after birth, however, there is a definite loss in weight of from six to ten ounces. This is due to the loss of fluid by skin, kidneys, lungs, and the substance from the bowel alluded to before. The initial weight, however, is regained by the end of the second week and thereafter there should be a steady gain. At the end of six months the infant should have nearly doubled its weight, and trebled it by the end of the first year. If the gain in weight during this first year is not maintained at the rate of four ounces a week, it means that something is wrong. Baby's nutrition is not satisfactory, and usually it is the feeding that is at fault, or a poor milk supply if the nursing is being done at the breast. During the second year there should be a gain of about twelve ounces *per month*, or at least six pounds in the year.

Feeding during the First Three Months.—However insufficient the milk supply may be, always attempt to nurse baby during this early critical period of its existence. The deficiency can be supplied with cow's milk, or a dried milk diluted 2 to 1 at first if it is not a humanized preparation (see Part II, Chaps. I and V).

Time of Nursing and Number of Feeds per Day.—The old custom of nursing an infant every two hours,

for the first few weeks at any rate, is no longer held to be necessary but looked upon rather as a great drain on the mother's health, so that breast-feeding becomes a nuisance to her. The tendency both in Germany and in America is rather to allow a four-hour interval between the feeds, and the practice is recommended by some physicians even in England. In most cases, however, this interval is far too long and it has been found that the needs of the average healthy infant are best met by allowing *intervals of three hours between the feeds* with six feeds in the day between 6 a.m. and 10 p.m. A mother will generally nurse her infant at the latter hour before retiring. Four feeds with an interval of three hours between each on that day brings the time to 10 a.m. This may be looked upon as the hour from which to start the day, the first nursing for the day being given at any time between 6 and 7 a.m. giving time for bathing, etc. During the night, a well-managed infant will not require to be nursed at all, *and no night feeding should be permitted* except, perhaps, during the first week. All this is a matter of habit and can be easily instilled by firmness.

It is wonderful to see how well the infant adapts itself to this routine, without needing any attention between 10 p.m. and 6 a.m. A little drink of water may be all that is necessary if there should be any sign of restlessness at night, and in fact during the day too, an ounce or two of water should be given occasionally apart from the feedings, especially in the hot season. Restlessness at night may, however, be an early sign

of failure of the milk supply and if it is also noticed that there is no gain in weight, consult a physician.

How to Nurse.—Each breast should be given alternately in successive feedings and should be thoroughly emptied, for this is the best means of increasing and keeping up the milk supply. The one breast of the average healthy mother is quite sufficient to meet the nutritive needs of the infant. A lazy and haphazard sucking of both breasts at the one nursing is to be rigidly disallowed, for this is the surest way of diminishing the secretion of milk. On no account therefore should both breasts be given at the same feeding unless the doctor finds reason to order it.

The time spent by the baby at the breast should be fifteen minutes and certainly not more than twenty minutes. At the end of that period it will fall asleep. Careful nursing in this way will result in the infant becoming restless and crying out when the next nursing period is due, and it will then take to the breast eagerly. There can be no more pernicious habit, bad both for mother and child, than to give the breast whenever the child cries. This practice is a common cause of wind, colic, and indigestion. The baby cries more often from thirst than from hunger in these early days or perhaps from the soiling of its napkin, the bite of a mosquito or because it is in pain from the overloading of its stomach caused by too frequent feeding already, and to make an attempt to ease the suffering by a renewal of nursing is most foolish and may be fraught with serious effects on its health. A far better plan

would be to omit the next feed and give it a teaspoonful of dill-water instead.

Diet during the next Three Months.—Mother's milk is still the ideal and breast-feeding should be continued as before, with an interval of three hours between the feeds and a total number of six nursings for the day. A teaspoonful of orange-juice, however, diluted with twice the quantity of boiled and cooled water, can be administered with benefit between the nursings twice or three times in the day. But unfortunately my experience has been that the breasts of many a mother are unable to yield a sufficient quantity of milk to supply the needs of the infant at some time during this period, if not before. (For signs, see Part II, Chap. I.) Any such insufficiency can be easily discovered by the doctor, for it is known that the average healthy baby requires $2\frac{1}{2}$ ounces of breast-milk for each pound of its body-weight in the twenty-four hours. In such cases bottle-feeding must be resorted to either in addition to the mother's milk at each nursing or as a substitute for one or more breast-feedings.

In the question of deficiency whether in quality or quantity or both, the mother must be content to be guided by the physician who by careful tests may alone decide what changes may be made as well as the necessary amounts. (For details of complementary feeding, see Artificial Feeding, Part II.)

How to Increase Breast-milk.—It is most important at such a time, however, that you use every effort to stimulate the breasts to function in a more adequate

manner for this is quite possible and often proves successful if persevered in. Complementary feeding, though necessary, must not be carelessly allowed to become the standing rule but looked upon as a more or less temporary expedient.

(i) Nervousness, worry, or any strong emotion are potent causes of a failing milk-supply. Rigidly exclude all such sources of the trouble and enjoin plenty of sleep, rest, and fresh air instead. The placid woman is the best nursing mother.

(ii) Make sure that the breast has been emptied at the end of each feed; otherwise empty it by hand.

(iii) Stimulate the appetite by means of nutritious food.

(iv) Massage the breasts two or three times a day from base to nipple, sponge them soon afterwards with cold water and then apply steam in the form of hot towels.

(v) Put baby to each breast in turn for five minutes before the complementary feed.

Diet after the Sixth Month.—Milk must again form the main diet for the next three months and right up to the end of the first year. The importance of milk in the dietary of children throughout the period of infancy should be fully realized. And up to the time of weaning, *breast-feeding* should be continued as before whenever possible, although a single bottle-feed may now be regularly substituted, in order to prepare the infant for an independent existence and also to give

rest to the mother. *The number of feeds per day can be reduced to five.*

As soon as two teeth have come fairly through, however, a little *extra* food in the form of cereals may be given, in addition to the breast-feeding, for that is a sign that there is now present in the saliva a ferment in sufficient quantity to digest starchy food effectively, and that the organ called the pancreas, which acts still more powerfully in the same direction, is functioning actively.

Kind of Cereal to be Used.—The cereal may take one or more of the following forms :

(i) A heaped teaspoonful of one of the malted foods described in Part II, Chap. VI.

(ii) A heaped teaspoonful of Robinson's patent barley or Groats.

(iii) A tablespoonful or two of a vegetable broth.

(iv) A tablespoonful or two of bread crumbs and milk.

(v) A tablespoonful or two of a simple or a dextrinized gruel.

(vi) A heaped teaspoonful of fine ground Scotch oatmeal. This is especially useful in regulating the bowels if they show a tendency to become constipated.

Mode of Administration.—The addition of this cereal food into the diet must be made very gradually, and a constant watch kept on the stools for any signs of indigestion, until by the end of the twelfth month, the full amount permissible is being tolerated with ease at three out of the five feeds for the day.

Up to the end of the tenth month when weaning will usually have been completed, the prepared cereal

may be made up semi-solid and given with a spoon before or after the breast-feed; or, if one or more bottle-feeds are being taken, you may in the case of some of these extras, add them uncooked to the milk before that is boiled.

The juice of half an orange diluted with water and sweetened with sugar may with advantage be also given during the day.

Begin with a malted food, or a gruel dextrinized at first, at the early afternoon feed; after about a fortnight, supplement the forenoon or the late afternoon feed with a small tablespoonful of vegetable broth; finally add a teaspoonful of groats or of Scotch oatmeal to the remaining one of the three feeds to which the addition of cereals is desirable. After weaning, one of Allenbury's rusks can also be given in order to teach baby to exercise its jaws.

A diet table for this period is given in Part II, Chap. II.

Weaning.—Preparation in this will already have been made by the giving of a single bottle-feed daily, and the introduction of farinaceous food will also have taken place. In such circumstances weaning is comparatively easy and is unattended by any disturbance of health. If, on the other hand, no cereals have so far been given, nor any cow's milk, or if weaning has to be abrupt because of serious illness of or accident to the mother, the change of diet must be made tentatively and cautiously, by diluting the milk, to that recommended for the six months old infant who has always

had artificial food. When it is certain that tolerance to the changed diet has been established, the fuller diet in respect of its age and weight can be more rapidly introduced, and the milk need no longer be diluted.

But too early weaning is to be deplored, if sufficient breast-milk is available, and may prove very injurious, bringing in a train of disorders of the digestive tract. In such circumstances, lose no time in endeavouring to induce the infant to take to the breast again, and if it refuses, which it may do, if it is older than six months, modify the cow's milk by the addition of *albulactin*, or make a trial of goat's milk with the same modification, or of a full cream dried milk diluted 2 to 1 (see Part II, Chaps. III and V). The trouble in many cases, however, is not that the cow's milk disagrees, but that the preparation of the feed is wrong, or that the weaning has been too abrupt.

It is generally agreed that weaning should begin by the end of the ninth month, with a margin of a few weeks earlier should the mother begin to suffer from persistent headaches—a warning to her of the strain on her health; or three to four weeks later, according as the health of the baby or other circumstances, and especially very hot and sultry weather, dictate.

A good working rule to observe is that when the mother is unable to satisfactorily nurse her baby at least twice a day, it should be weaned.

If baby is already having a single bottle-feed daily as generally recommended after the sixth month, there remain only four other nursings at the breast which

have to be replaced. In such a case begin with a bottle-feed of cow's milk (which generally need not be diluted), in place of one of the afternoon nursings. Continue in this way, with two bottle-feeds daily, for one week; then change another breast-feed in the same way and so on. The last nursing to be given up should be the early morning one, for it has been already mentioned that the breast secretes more milk in the morning than at any other time of the day. The whole process will take four weeks.

Diet from Nine to Twelve Months and After.—See Part II.

Wet Nurse.—Wet nursing is still popular in Tropical countries among some people, but has undoubted drawbacks. The chief difficulty in the case of the wet nurse who is hired concerns her antecedents, for not only must her own health be good but she should come of a stock free from the taint of any constitutional disease. A Wasserman test of the blood must always be done.

As a general rule therefore the nurse whose milk is bought, is not to be recommended. But in the case of an infant delicate at birth, who is not thriving on artificial feeding, or who has been debilitated by illness, a wet nurse will often prove most effective in restoring nutrition and health such as no other treatment can.

The ideal wet nurse should be of a quiet and cheerful disposition, young, not above thirty years of age, and of a robust constitution. Her skin must be free from any eruption, and she must have good sound teeth

with firm gums, clean tongue, and sweet breath. The breasts must be firm, with well-developed nipples, and the milk abundant and rich. The age of her own child must not differ materially from that of the foster-infant. She must be scrupulously clean in her habits and preserve her health by a simple nourishing diet and fresh air. Any return of her periods while nursing is an indication for a change of nurse. A wet nurse from the country is always preferable to the town-dweller.

CHAPTER III

THE HEALTH OF THE MOTHER DURING LACTATION

Care of the Breasts.—Sometimes, about the third day, when the milk flow has become established, the breasts become engorged and painful, and dilated veins may be seen on their surface. When touched they are tender and hard lumps may be felt in them. This condition of “caked breast” may deprive the mother of sleep. It usually rights itself as soon as the secretion of milk adjusts itself to the demands made by the infant. Otherwise hot boracic poultices covered by oiled silk should be applied every, hour for four hours over the whole breast, with the exception of the nipples. Warm olive oil should next be taken by the nurse and smeared over the breast, which is then massaged downwards to the nipple. Soon afterwards the baby is given the breast. If the condition proves obstinate the mother should have very little fluid in her diet and take an aperient of a teaspoonful each of Glauber’s salts and Epsom salts, dissolved in half a tumbler of warm water in the mornings on an empty stomach. The breasts should also be elevated and a binder applied firmly but not too tightly. This binder may take the form of a piece of sheeting or of a towel, and should

extend from the armpit to well below the breast. It must be fixed in front with safety pins.

Sore Nipples.—The best way to prevent soreness of the nipples is to prepare them for nursing from quite an early period of pregnancy by bathing them night and morning with warm water. They may next, if retracted, be gently manipulated with the palm or surface of the thumb and index finger, dried by gentle friction with a towel, and anointed with a little lanolin. The use of Eau de Cologne or spirit to harden them is not to be recommended. If retraction cannot be remedied by manipulation as directed above, Violet Russell recommends a self-suction breast reliever * but strongly condemns the breast pump.

During the period of nursing, the same care is necessary, the nipples being bathed both before and after the baby is put to the breast, with a swab of cotton-wool soaked in a saturated solution of boric acid and then thoroughly dried. These should always be kept at hand. Then rub in a little lanolin if there is any tendency to chapping.

A sure way of inducing soreness is the habit some babies have of frequently letting the nipples drop and then catching hold of them again. This is due to a faulty position so that the infant's face is buried in the breast. Always prevent this. Protect the nipples further by pinning on a sterile swab, or a linen or silk handkerchief so folded, inside the clothing. The sterility can be secured by ironing them. Relieve any

* *Lancet*, Vol. II, 1924.

tenderness by painting on Friar's balsam (a 5 per cent. solution in paraffin, which the chemist can make up for you) or glycerine of tannic acid. A nipple shield should be afterwards worn at nursing time. For deep cracks or fissures at the base, apply an antiseptic dressing of collosol iodine; then dry and paint them over with a 2 per cent. solution of silver nitrate. Give the breast a rest for twenty-four hours. A crack in the nipple is an exquisitely painful affection, so that the mother dreads nursing, and this in itself is a sufficient cause of a diminution in the supply of breast milk. Hence the importance of preventing one from forming.

Mastitis or inflammation of the breast results from infection through a crack in the nipple. This happens as early as the first or as late as the third week after delivery. The condition is ushered in with headache and pains in the breast and may go on to abscess formation. The signs of this are high fever with redness of the skin of the lower part of the breast, swelling, and much tenderness. In the earlier stages it is best to wean the infant temporarily and apply a tight binder. Over this place an ice bag. Breast-feeding can be resumed when the temperature has been normal for twenty-four hours. The period of artificial feeding will, of course, be prolonged if an abscess forms in the breast. This will have to be opened by a doctor and a week later the infant can take the breast again if care is taken that the first portion of milk is drawn off at each nursing. But if the abscess is small and superficial the baby need not be taken off the breast at all.

Diet.—The meals taken by the mother during the first few days should be light but nourishing. When she has once left her bed she can resume her normal diet but should avoid such articles as salads, radishes, cauliflower, onions, uncooked vegetables and tinned foods, or whatever is likely to upset her digestion, because that would affect the character of her milk and may upset the baby. Stout is quite unnecessary, for the popular idea that it increases the quantity of milk secreted is fallacious. Instead, gruels with milk, Mellin's lacto, the preparation known as Lactagol, cocoa, and Horlick's malted milk may form part of her dietary. In a word, drink plenty of milk and plenty of water.

Exercise must on no account be neglected. A couple of hours daily in the fresh open air is of great importance in maintaining health.

Sleep.—A good night's rest is a great necessity, and to secure this there should be no night nursing after the 10 p.m. feed excepting during the first week. Sleep will be all the more undisturbed if the baby is in a different room. In hot countries a rest in the afternoon should also be taken after the 1 o'clock nursing.

The bowels should be kept acting daily by the due regulation of diet and exercise, and the drinking of a sufficient quantity of fluids, which will in most cases prove successful. Should these measures fail, twenty to thirty drops of cascara evacuant in half a wineglassful of water at bedtime will be all that is necessary. Saline cathartics should on no account be taken as they may act on the infant through the milk. If the bowels

have not been opened through the day, a simple soap and water enema should be administered the last thing at night or a glycerine suppository used.

Menstruation and Pregnancy.—The onset of the first menstruation after parturition especially may cause slight digestive disturbances in baby, with perhaps colic and an increase in the number of the stools. Breast-feeding should *not* be abandoned for that reason, however, even temporarily.

If, on the other hand, pregnancy should supervene, the infant should be weaned unless undue feebleness on its part makes it desirable that you should continue to bear the added strain of nursing.

CHAPTER IV

GENERAL HYGIENE OF THE NURSERY

Ventilation.—Light and air are necessary to the healthful growth of nearly all living creatures, and pure fresh air is of extreme importance to children. The room chosen for the nursery, therefore, should be large and airy and so situated that its atmosphere can be purified by the morning sun. It should not be near a closet or the kitchen, and there should be no evil-smelling drains in the vicinity. The furnishings should be limited to necessary articles only and all heavy draperies eschewed. The practice among some classes of keeping children all day in closed rooms is most objectionable. Windows should always be kept open to promote a free circulation of air in the room, but the sun should not be allowed to glare directly into the room when it is occupied, nor even to shine directly on the glass of the shutters without the intervention of venetians or blinds. Even at night every effort should be made to secure this free circulation by keeping a venetian shutter open if available, or the use of an electric fan. This, of course, only applies to the hot, low-lying districts.

Although it is a wise plan generally not to allow the wind to play on a child's body during the hours of

sleep, I think that during the hot months of March, April, and May, a window or two may safely be left open, and is preferable to the little ones being restless from heat if a fan is not available. Due care must be taken, however, to protect the sleeping cot from a draught, which may be done by a screen when a window is left open or a fan is used. The cot would best be placed by the side of an inner wall of the room in such a case. During the north-east monsoon from November to April, close all openings facing north and east. The north or long shore wind, as it is called, and the east land wind must be particularly guarded against for they often usher in pneumonia. The bungalow should on no account be damp and new houses, as well as those built on made soil, should be avoided. Make sure that there is no swamp or river near by and that all jungle brushwood is cleared for a good distance round. Empty cans and tins should not be thrown about the compound, and all pools of water should be filled in to prevent the malaria-bearing mosquito from breeding in them.

Dress.—Next in importance to the proper feeding of infants is the choice and suitable regulation of their clothing in accordance with change of climate and season, which should engage the care and supervision of all mothers and nurses. The infant's clothing should be light and soft, and arranged so as not to interfere with the free play of its limbs. On the other hand, every precaution must be taken to prevent exposure and protect baby from a chill. This is very easily

acquired in the later afternoon, when the temperature is apt to drop a few degrees, especially during the later months of the north-east monsoon in January and February, or by the cool night air. So, also, the afternoon showers of the north-east monsoon are preceded by a distinct drop in the temperature, while the rains of the south-west monsoon also make the atmosphere appreciably cooler. A due appreciation of these facts will help the mother in clothing her infant accordingly. The great principle to be observed is that the clothing must be light in the hot season and at all times when the atmospheric temperature is high, with additional covering and the use of warmer material in the cooler weather. The binder should in all cases be of soft flannel and must not be applied too tightly, but otherwise flannel should not be worn next the skin unless the infant is delicate or in the case of the older child, if he is subject to colds, or digestive disorders, when a thin flannel banyan or shirt may be worn reaching down to the knees. Merino or wool is preferable otherwise. All clothes should be made to fit loose. In the colder up-country districts, wool vests and flannel dresses should be the materials of choice.

The head should always be kept uncovered in the day-time, and socks should be worn at all times during the first year—cotton in hot, merino or woollen in cold weather—from the time that the feet are no longer covered by the dress. For children above the age of infancy the lower portion of the dress should always be made in the shape of trousers. The upper part of

the dress or bodice must have flat buttons attached at the lower end, to which the holes on the trousers can be attached. Such a garment is particularly useful at night in preventing sudden chilling of the body if the bed clothes happen to be thrown off, but it might preferably be made in one piece for such wear.

Sleep.—For the first few months of its life, a healthy infant naturally spends the greater part of the day in sleep, waking up only to be fed. During the first month make it lie alternately on one side or the other, so that, if there is any possetting, the milk may not find its way into the windpipe and choke it.

By the end of the first year the amount of sleep required is much less, but a mid-day sleep should always be encouraged up to the age of five years. In this matter of sleep too, train baby to regular habits from the beginning by putting it to bed at stated times and placing it there directly. The practice of nursing infants to sleep in the arms must always be discouraged. Further, avoid all soothing syrups, cordials, or sleeping drops, as likely to do much harm. Ayahs are rather disposed to suggest such remedies or to administer them of their own accord. Such a possibility can be prevented from the very beginning if the mother will make it a rule to administer medicines to baby herself. Nothing of the sort should ever be given except under medical advice. If such soothing medicines are being used unknown to you, the breathing may be seen to

become irregular during sleep and the child is wont to doze off at once after being waked. If the practice is continued it becomes listless and pale and loses weight.

Sleeplessness is best combated by fresh air and exercise and attention to any gastro-intestinal trouble that may be present.

The Daily Bath.—Make sure that baby has a warm bath, at least once a day, *i.e.* every morning, for cleanliness is very necessary to the well-being of all children. The temperature of the water should never exceed 100°. Test the heat with a bath thermometer preferably, or with your elbow, *not* with your hand. In the evening it will be sufficient to have the face, hands, and buttocks sponged. The bath must be preceded by a gentle rubbing of the body over with a soft warm towel, if the skin is wet with perspiration. The bathing should be done with a soft sponge after which the body is dried with the same kind of soft towel. Johnson and Johnson's nursery powder, or a dusting powder consisting of two parts starch and one part boric acid is then dabbed in the hollows and folds of the skin. After the third month, the temperature of the water may be tepid, but quite cold water must not be used for infants as they quite easily take chill from slight changes of temperature.

Children beyond the age of infancy should be bathed and dressed twice a day and cold water may generally be used. For children who are delicate and lack vigour, tepid baths are advisable. It is a mistake to enforce cold water with the idea of hardening them.

Baths of sea water have been highly recommended for some cases of constitutional debility for their invigorating effect. If made use of they must in no case be prolonged.

Exercise.—Infants should be taken out of doors morning and evening by the nurse or ayah, weather permitting, after the first week or fortnight, because exercise is essential to the maintenance of their health. The nurse should be directed to keep on the move and carry the infant about as the best means of obtaining this. Further, give baby every facility to exercise its muscles by placing it on a rug just before the morning bath, with all garments taken off, for a few minutes. He can then kick about and move his arms freely. Take care to protect him from a draught, however. As soon as a child learns to walk, let him run about in the open air as much as possible, but take care to protect his head from the sun. Further, it is most desirable that children be made to use their own limbs and not be kept in their perambulators or in cars all the time they are out.

The Ayah's Daily Routine.—Since in most homes in the Tropics the ayah has become a *sine qua non*, this would be a fitting place to outline her duties to the infant, so that the mother may be certain that her baby is being cared for in the correct way. It is not sufficient merely to instruct her along the lines indicated here, but strict supervision should be maintained always, for only thus can much ill-health in after-years be averted from the child since the services of a well-

trained European nurse are only available to the few. The day should begin with the introduction to what should be the habit of a life-time—the infant must be taken from its cradle and “held out” so that it may pass water. Regularly trained in this way it will have learned to control the reflex actions of the bladder by the end of the first year.

After the morning outdoor exercise the infant should be regularly set on a chamber in order that regular daily evacuation of the bowels may be encouraged till it early becomes a habit. And even from the early months of life and before the use of a chamber is practicable, the baby can be taught what is expected of him by spreading out a napkin and placing him on it morning and evening. Early training is most important in this respect, for he soon comes to associate the feel of the napkin or of the chamber with the movement of his bowels which will soon come to open with clockwork regularity, and that great evil which is far too common nowadays—constipation—will never trouble him. The bowels may further be encouraged to act at stated times by gently stimulating the muscle which closes the rectum by passing in for an inch or two a soft rubber catheter, smeared with vaseline, for a few days, or by the use of a glycerine suppository.

Too much stress cannot be laid on the importance of this systematic regularity in every phase of an infant's upbringing, and mothers should lay it to heart that habits when formed reap character.

All children should be taken out for air and exercise at least twice a day after the first fortnight of life.

The evening meal will be given on the return from the walk, after which the infant should be put to bed. This should again be preceded by raising it and holding it out over a chamber as in the early morning.

In all low-country malarial districts the cot or bassinette must be provided with a mosquito net of close mesh to prevent the bites of mosquitoes and to ward off malaria, which is no respecter of age. Two other very important duties, which are too often neglected or forgotten, devolve upon the nurse or ayah. The one concerns the after health of the child, the other its physical appearance. The first refers to the

Care of the Nostrils.—An infant is unable to blow his nose so that inspissated mucus is apt to collect in the nostrils, become dry, and prevent normal easy breathing. Thus, mouth breathing with its attendant evils becomes established. The nostrils must, therefore, receive attention from an early age and be cleaned out with a camel's hair brush or a piece of clean cotton wool wrapped round a match-stick and dipped in a mixture of one part of glycothymoline and three parts of water; or bicarbonate of soda, five grains to the ounce. Sneezing can be excited by gently rubbing the lining of the nostrils just inside with a camel's hair brush. A little boracic ointment may then be smeared just within the nostrils.

The second care is that of the ears, which in some cases stick out of the head and prove so unsightly in

after years. Up to about the sixth month of life they should be massaged down twice a day, preferably after the bath, if there is any tendency at all for them to protrude. During sleep care must be taken to see that they do not become twisted on the pillow, and to this end it is wise to have a night-cap secured over the ears during the hours of sleep.

Toilet of the Mouth.—The mouth, too, should receive attention and after each nursing should be very gently cleaned out with a piece of linen wrapped round the finger and dipped into warm water. When the teeth are all through, they should be daily brushed with a soft tooth brush dipped in a small tumbler of water containing a few drops of Odol.

Vaccination as a protection against small-pox is compulsory in this country. It is best done after the first month and up to the third or fourth month after an infant's birth. The operation is quite simple and need not cause any anxiety to the mother. It is performed by making a little scratch in the skin of the arm or leg and gently rubbing in a drop of glycerinated calf lymph. The best season of the year at which to have a baby vaccinated is one that is cool and dry, that is the period from the beginning of December to the end of February. Vaccination had better not be done during the rains of the monsoons or the hot weather from March to the end of May, as more likely to cause complications. These need not be feared, however, if ordinary care and cleanliness are exercised. The most important desiderata, after the vaccination

has been performed, are to prevent scratching of the little wounds, rubbing of the clothes against them, and the access of dirt. Sleeves must therefore be worn quite loose. Protection from dirt and irritation is best secured by lightly tying over the scratches a sterilized gauze pad.

The results of the vaccination are that the little spots enlarge and swell up till by the end of the first week a little blister has formed in each. These later turn dark with an inflamed area round them, and dry up, and a scab forms which falls off by the end of the twenty-first day leaving a scar. The part should not be bathed unless there is much severe pain and inflammation, when alone it is permissible to apply hot fomentations.

CHAPTER V

THE SIGNIFICANCE OF ABNORMAL STOOLS IN THE BREAST-FED BABY

A BREAST-FED infant has from two to four stools daily in the first few months of its life, but only one or two later on. The bowel movements of the bottle-fed baby, on the other hand, are less frequent, only one or two in the day, and such an infant may, moreover, slip a day unless a laxative is given.

The healthy motion of the former resembles the yolk of a hard-boiled egg, but is somewhat less solid ; it is light yellow in colour, and acid rather than alkaline in reaction. It has the same consistency throughout and its odour is not unpleasant. A greenish tinge may sometimes appear on the stool in a little while, but is of no real significance as it is produced merely by a surface oxidation of the normal pigment or colouring matter. It must also be emphasized that sometimes, in the earlier months especially, though there is nothing particularly wrong, the stools may be greenish and even more frequent than normal and contain also some mucus and soft curds. Do not let this worry you as long as baby is still gaining weight, for such an occurrence is quite consistent with good health. The giving of a couple or more teaspoonfuls of protein milk or of

twenty grains or a half measureful of albulactin dissolved in two teaspoonfuls of water just before nursing baby, will often correct such stools and change them to yellow pasty ones (see, also, *Overfeeding*, p. 86).

Variations from this normal standard consist in the presence of mucus with or without curds in the stools, a greenish diarrhoea with or without signs of fermentation or a change in colour and reaction. Such variations may be an evidence of some infection in the bowel, or elsewhere in the body; of a change in the quality or quantity of the mother's milk; or may point to an inability to digest one or another of the elements which compose it, that is an idiosyncrasy towards breast milk.

For all practical purposes, however, it may be stated that infection in the bowel is practically unknown in a properly brought-up baby fed on breast milk and is also rare elsewhere in the body. Any disorder of nutrition in such infants is much more likely to be due to a too free flow of the milk or perhaps to insufficiency of food from a scanty supply.

Unfortunately it is too hastily assumed in such cases that the mother's milk does not agree with the baby, whereas the fault in most cases lies in the fact that the proper technique of breast-feeding has not been understood and is not being practised. During the first few weeks of the baby's life, for example, there is sometimes a tendency to *overfeeding* from over secretion of the milk. This is only a temporary condition, however, as the condition is apt to right itself by *regurgitation* of the extra milk taken in, which is brought up undigested.

Generally the infant stops sucking when it has had enough, however, and the over action of the breast soon ceases according to its nicely adopted rôle of supplying just as much as is asked of it and no more. If this regurgitation of the excess of milk swallowed is not correctly interpreted and the mother feeds her infant again or oftener, diarrhoea is apt to follow, and half a dozen or more green, irritating stools may be passed in the day, which are very acid in reaction (this is easily tested by passing a piece of blue litmus paper, which can be obtained from the chemist, through the middle portion of the stool when it will turn red in colour), and contain mucus and undigested fatty curds. The baby also then really vomits partially digested milk during or after the feedings, and most probably loses weight.

The diagnosis can only be made by weighing the baby (with only his diaper on, before and after a nursing period) and so calculating from the change in the weight how much milk has been ingested. A comparison of this with the average amount normally taken by a child of the same weight and age will give the necessary information.

Treatment consists in omitting a feed and beginning again with due attention to the method of feeding advocated under *Breast-feeding*. Sometimes, if there is a very free secretion of milk, it may be necessary to lessen the time at the breast on each occasion and also prolong the intervals between them. Further, give a spoonful of water just before putting baby to the

breast. If these measures fail, the question of too great richness of the breast milk in fat will have to be considered.

Too high a Fat Content.—This may rarely be the cause of a diarrhoea with green acid stools. Analysis of several "middle" samples in the day, expressed after the baby has taken the breast for a couple of minutes, can alone be relied on, but the condition may be suspected in mothers who are well nourished and stout, who live luxuriously, and take no exercise. To correct such a condition, they should have plain food and take plenty of fresh air and exercise. If these measures fail, a little skimmed cow's milk diluted (1:2), or protein milk given before a smaller breast feed than usual, will often correct the stools.

Small Dark Green Stools with Mucus.—Such stools may be passed frequently when baby is hungry because the breast milk is insufficient. Or the same sort of stool may point to poorness in fat-content in a hard-working and worried mother, or the highly emotional society woman. The infant is peevish, cries often, looks pale and either loses weight or does not make the expected gains. The scales will tell you whether the stools are "hunger" stools (see Complementary Feeding, Part II, Chap. I).

Treatment.—Use every means to improve the quantity and quality of the breast milk (see Part II, Chap. I) and do not be in a hurry to give up nursing. Improve your own health by good nourishing food, fresh air, and exercise. Make sure that you are follow-

ing the rules as to nursing recommended in Chap. II. At any rate, complete weaning is most injudicious before the sixth month. On the other hand, the deficiency can be easily met by giving diluted cow's milk or dried milk to the proper amount after each nursing, and perhaps substituting a bottle feed for one of the breast feeds. The additional artificial feed will in most cases be found to be well tolerated. If poorness in fat is the trouble, the extra milk should be "top milk" from the cow, which contains most of the fat, or a full cream dried milk.

For directions, see Artificial Feeding, Part II, Chaps. I and II.

Illness on the part of the mother or the child will also interfere with the nutrition of the latter and produce unhealthy stools. An acute illness on the part of the mother most often disturbs the child by reason of a change in the quantity and quality of the milk, so that this has to be remedied, but weaning is not called for unless for the sake of the mother's health, or to prevent infection.

The method of feeding, in illness of the child, on the other hand, demands serious consideration when it is unable to take the breast. Artificial feeding must on no account be resorted to at such a time, however, but small quantities of breast milk expressed by hand should be given at regular intervals. Hess recommends * feeding these infants by means of a catheter from an early stage and administering, besides boiled water,

* *J. A. M. A.*, Vol. I, 1923.

broths and cereal decoctions between the feedings, to ensure a sufficient intake of water. A little bicarbonate of soda may be added to the drinks of water.

An intolerance to one or more constituents of its own mother's milk has been remedied by injecting a few cubic centimetres drawn from the breast deep into the gluteal muscles of the infant.

Drugs are quite uncalled for in any of these conditions.

CHAPTER VI

DENTITION AND ITS DISORDERS . . . . .	40

THE average infant begins to cut its first teeth about the sixth month, and thereafter the process goes on steadily, till by the end of the second year the set of twenty *milk teeth*, as they are called, will have appeared ; that is, ten in each jaw. The following table shows the order in which the milk teeth appear and the average time of their eruption. There may, however, be wide limits as to age, and even, though less frequently, as to order of sequence. As a general rule, each kind of tooth appears earlier in the lower jaw :

Temporary Teeth :

2 Central incisors or Cutting teeth	lower, 6th month
	upper, 7th „
2 Lateral incisors . . .	upper, 9th „
	lower, 10th „
2 First molars or Grinders .	12th month
2 Canines or eye teeth . .	18th „
2 Second molars . . .	2nd year.

As a rule the two central incisors of the lower jaw are the first to appear and these are followed a week or two later by the corresponding teeth of the upper jaw. In from a month to six weeks after this, the lateral incisors make their appearance, those of the upper

jaw first. About the twelfth or fourteenth month the anterior molars of the lower jaw are cut, those of the upper jaw appearing shortly afterwards. The eye teeth come to the surface between the sixteenth and twentieth months, and between the twentieth and thirtieth the last milk teeth, namely the second molars, are seen. The Twenty milk teeth have, therefore, generally made their way through the gums by the thirtieth month of life. Sometimes in a debilitated child, the whole process of dentition is considerably delayed and the first teeth may not be cut till the first year is drawing to a close.

After the full set of these temporary teeth have appeared, there is a pause until the sixth or seventh year. Then the second or permanent set of teeth gradually make their way through the gums, by pushing out the milk teeth, which become loosened and detached. They are thirty-two in number, sixteen in each jaw. The earliest to appear are the *first molars*, four in number, in the sixth year, one on each side in both jaws. The eight incisors push their way through the gums from the seventh to the ninth year. With the exception of the third molar or wisdom teeth, the rest may be expected to show from the tenth to the thirteenth year.

Teething is a perfectly natural process and many infants cut their teeth very readily without any unfavourable symptoms. But yet, there can be no doubt that in some cases the eruption of the teeth is attended by very definite disorders of the system which can be readily understood when one considers that the infant

during the latter half of the first year is rapidly developing and that his nervous system which is at this period of life very unstable is easily upset by causes in themselves perhaps trivial and not likely to have any effect on his health at any other time. At the same time due warning must be given here that all troubles at this period should not be attributed to teething as a cloak for ignorance.

Symptoms.—The disturbances which may with reason be associated with the primary dentition concern chiefly the nervous system and the gastro-intestinal tract. They may be mild or severe.

In *mild cases* for some weeks before any teeth are cut there may be a slight nervous excitement on the part of the infant, but the first real indication of their near appearance above the gums is a constant dribbling of saliva from the mouth. The little one becomes restless, feverish and fretful, refuses some of his feeds or takes them in smaller quantity and bites any hard substance he can lay hold of; sleep is disturbed by frequent startings and restlessness and he wakes up often with a cry. As a result of the restless nights he may look pale and listless. A slight bronchitis is often present. The skin and particularly the forehead feels hot and dry and there is great thirst so that he drinks water eagerly. The bowels may become relaxed, and greenish, watery stools may be passed. The gums may appear swollen and feel hot if there is any difficulty in the eruption of the tooth. All these symptoms disappear quickly as soon as the tooth comes through

and in these mild cases it is quite unnecessary to call in medical aid.

In *severe cases*, there is continued feverishness and a daily evening rise of temperature, the head feels very hot and the infant becomes extremely restless tossing his head from side to side or beating it with his fists. Severe vomiting may be present, the milk being brought up curdled. Irritation of the brain is shown by twitchings of the muscles, to be sometimes followed by convulsions; and there may be retraction of the head owing to inflammation in the middle-ear. Frequent loose greenish stools are passed which make the little one look weak and exhausted.

It is but natural that a mother should feel anxious at such times, for these symptoms are apt to prove very serious in Tropical countries and many healthy children whose ailments during teething were only trivial at first, have been the victims of diarrhœa or convulsions. In all cases, therefore, where restlessness, sleeplessness and diarrhœa are marked, medical aid should be requisitioned without delay.

Some mothers are also wont to attribute skin eruptions to teething, but there is no evidence to support such a belief although because of the gastro-intestinal disturbance that is usually present, such an affection as nettle-rash may be present at these times.

The eruption of the permanent set of teeth, is hardly attended by any notice on the part of mother or child and need not be considered.

Treatment.—When there is no disturbance of the

health and dentition is proceeding favourably, the gums may be gently rubbed with the finger moistened in a little honey. This will allay the irritation. Keep the head uncovered so that it may be as cool as possible, but keep the body and feet warm. The daily warm baths should be continued, the head being preferably sponged with cold water. The diet must be lighter than usual and the child's stomach must not be overloaded. Fresh air and exercise are more than ever necessary and should not be neglected on any account. If there is any tendency to constipation, the bowels should be kept regularly acting by means of a teaspoonful of liquid paraffin at night or some fluid magnesia, which can be obtained from any chemist.

In the *milder disturbances*, the following additional measures must be taken to meet the various symptoms :

(i) When the skin is hot and dry and there is fever, give six powders of Formula No. 15 and mixture, Formula No. 2.

(ii) If bronchitis is present, give mixture Formula No. 2 with one grain of carbonate of ammonium and two grains of iodide of potassium added.

(iii) Vomiting may be relieved by diluting the milk with lime water, in the proportion of a teaspoonful to ten ounces of milk and water. If the vomiting proves troublesome give only small quantities of food at a time, ice cooled, as well as bits of ice to suck, and inject into the rectum two grains of chloral dissolved in a tablespoonful of warm water. A poultice of mustard made into a paste with cold water and mixed with bread

crumbs and applied within the folds of a soft linen handkerchief to the pit of the stomach till the skin becomes reddened, will often give relief. If the fluid lost by vomiting is at all excessive, it must be replaced by injections under the skin of a solution made by dissolving a teaspoonful of table salt in a pint of water.

(iv) The loose green motions do not need any drug treatment other than the aperient powders or a dose of castor oil at the beginning, and a reduction in the amount of food.

(v) The sleeplessness and restlessness are best treated by the regular use of the warm bath twice a day and the treatment of any constipation if present. Soothing syrups, cordials, and teething powders must on no account be administered. Keep a strict watch over the ayah lest she administer any of these surreptitiously, or some narcotic obtained from the bazaars.

In the *severe* disturbances that attend teething such as the twitching of muscles or the onset of convulsions or severe diarrhoea, always summon medical aid as soon as possible. Twitching of the muscles should be looked upon as a preliminary warning that convulsions may follow. Hence the condition must be promptly treated by placing the infant in a bath of hot water at a temperature of 100° for about three minutes, taking care to keep the head cool, however. It is then rapidly dried and wrapped in a warm dry blanket so as to be made to perspire. At the same time you can administer a dose of one grain of calomel with two grains of bicarbonate of soda pending the arrival of the doctor.

Convulsions in an infant are always a source of anxiety to a mother, but are not always of immediate grave import unless they occur in quick succession. To the medical man, however, they assume a serious aspect rather from a likelihood of their being a precursor of epilepsy in after years. No time must be lost, therefore, in bringing the fits under control. The first and simplest remedy consists in the hot bath as detailed above, which the mother or nurse might give even before medical aid has been obtained. The hot pack is, however, even better than the bath. The infant is wrapped in a hot *wet* blanket (with the exception of the head which must be kept cool) for five minutes. It is then quickly dried and wrapped in a warm *dry* blanket for a quarter of an hour until profuse perspiration breaks out.

Proper medical treatment consists in the prescribing of an immediate rectal injection of five grains of chloral hydrate and ten grains of potassium bromide in an ounce of warm water. This dose is suitable for a child of one year of age, but must be suitably decreased or increased as necessary. The injection must be preceded by a plain warm water enema of three or four ounces to cleanse the bowel.

Severe fits can always be controlled by a few whiffs of chloroform. Further treatment must consist in the administration of a mixture of two grains of chloral hydrate and five grains of bromide of ammonium in a teaspoonful of water by mouth every six hours for twenty-four hours to an infant of the same age, and

thereafter in half doses until there have been no fits at all for two clear days.

Severe green watery diarrhoea points to some infection of the bowel. Stop all milk at once and send for the doctor, giving only plain boiled water for six to twelve hours in the meantime. The medical man must make a careful inquiry into the diet, its method of preparation and quantity, and make sure that steps are being taken to ensure cleanliness and the prevention of infection. (For treatment, see under Diarrhoea in Part III.)

Lancing of the Gums is not a practice that is considered necessary at all in most cases at the present day and will only rarely be called for. Besides, the proceeding is not without danger, as septic infection may follow. The operation can, therefore, only be justified if the medical man is unable to procure rest to the child by any other means, when the gum is found swollen, inflamed, tender, dry, and hot. In any case the lancing has no effect in bringing on the teeth and only gives relief by easing the tension and lessening the pain. A more preferable means of securing this is by the administration of three minims of paregoric.

CHAPTER VIII

THE PREMATURE INFANT AND THE WEAKLING

THE premature infant is understood here to mean not merely one that has been born before its full term of intra-uterine life has been completed, for many such need no special care, but one that has certain special features in its make-up that call for attention and care. These are :

1. Lowered vitality.
2. A subnormal temperature with a ready tendency to great variations.
3. Feeble breathing so that periods of stoppage of breathing may occur and lead to death by suffocation.
4. An increased liability to hæmorrhage.
5. Weak powers of digestion.
6. Attacks of cyanosis.

It is a good working rule to look upon all babies that weigh less than $5\frac{1}{2}$ pounds as abnormal and needing special methods of up-bringing. The circumference of the shoulders is always less than that of the head in all such infants.

Clothing.—The first necessity is warmth. This is not difficult to secure in tropical countries. The baby must be received in a warmed blanket when born and clothed in woollen garments with blind sleeves to keep

the hands covered. In cold weather and in up-country districts, swathe the upper part of the body in cotton wool, only keeping the face exposed. Wrap the lower limbs in blanket material so that soiled napkins may be removed without much handling or exposure of the body.

Baths.—Both heat and cold, on the other hand, affect such babies. They are easily burned and easily chilled. Therefore postpone the initial bath in the case of the smaller and weaker infant and later employ sponging before the regular use of the tub.

The Weight Curve.—The initial loss of weight may be pronounced and the birth weight may not be regained for about three weeks. As a great help to the attainment of this end, give the baby an ounce or two of water daily in quantities of one or two teaspoonsful at a time. There should then be a steady gain in weight of at least a quarter of an ounce a day even in the puny baby.

General Measures.—Handle the baby as little as possible and do not even raise it from the cot for feeding at first. Change its position frequently since its powers of breathing are so feeble. Perform artificial respiration when necessary. A careful and trusted nurse may be employed to keep a constant watch on baby. Remove all napkins directly they are soiled. Frequent inspection may be necessary that this may be done. Scrupulous cleanliness must mark every action as premature babies are very liable to infection.

Feeding(i) *Breast-feeding for those Able to Nurse at the Breast.*

—Do not put baby to the breast for the first eight hours ; but for the rest of the first twenty-four hours, nurse it three or four times. On the second day put baby to the breast every three hours for two or three minutes at a time. It will no doubt obtain very little from the breast but because it has so little strength give a complementary feed of milk expressed from the breast of a wet nurse, if available, and diluted, directly afterwards with a spoon ; otherwise, of dried humanized milk (see Part II, Chap. V) or of sweetened condensed milk diluted 1 in 8. When the breasts have begun to secrete, continue the three-hourly nursing, making sure that the baby gets neither too much nor too little, varying the intervals and length of time at the breast as found necessary.

(ii) *Feeding with Expressed Breast Milk for those Unable to Nurse.*—As the baby is unable to suck the breast, the milk will have to be drawn off. The feeding can be done in one of several ways according to the development of the baby.

(1) By means of a medicine dropper with a rubber tube attached, so that the milk is dropped into the mouth.

(2) By means of a small catheter attached to the barrel of a syringe, which is passed horizontally along the floor of the nose till it reaches the back of the throat, and then on into the stomach. This is one of the best

methods for the very premature infant who cannot swallow easily.

(3) A small teat attached to a pen-filler or the barrel of a syringe.

(4) By means of a spoon.

Composition of the Food.—The only food likely to give these babies a chance of life is breast milk, which must be expressed from a wet nurse and given diluted.

An ounce of breast milk per pound of the weight is about the amount necessary for the day at first, although, probably, the smaller infants will only take an ounce for the day. Increase this amount by a quarter of a teaspoonful a day at each feed of ten to twelve feeds, so that by the tenth day the quantity will be about four ounces per day. Then increase by half an ounce each day for the whole day and keep on in this way till the infant receives and is able to retain three ounces for each pound of its weight. By the end of the third week, however, the baby will probably be able to suck, and normal breast-feeding can be started, with complemental feeds as the method of choice (as described in Part II, Chap. I) if there is an insufficiency of breast milk.

(iii) *Artificial Feeding.*—A high death-rate is to be expected when the artificial feeding of premature babies is adopted. Therefore always nurse them at the breast when a wet nurse is not available, even if there is only very little secretion. If artificial feeding is absolutely necessary, begin with sweetened condensed milk diluted 1 : 8. This is a good substitute for breast milk

up to the tenth day because of its high sugar content and low value in fat and protein. After the tenth day, as the digestive capacity of the baby improves, unsweetened condensed milk (Ideal Brand) diluted three times and with sugar added, or a dried humanized milk also diluted, can take its place, since they contain more fats and protein. Skimmed lactic acid milk is also coming to the fore as a substitute. Later on, a peptonized $\frac{1}{2}$ Cream dried milk or peptonized cow's milk modified by greater dilution with water than necessary for preparing it, may be tried, to be changed in time to whole lactic acid milk, dried milk, or cow's milk with less predigestion.

In this way only can these premature babies be educated towards digestion of protein and fat.

The Vitamins are more than ever necessary for the premature infant. Cod-liver oil emulsion or Ostelin may be administered as early as the fourth week and fruit juice in the third week. Fresh air in the sunshine and perhaps ultra-violet light will be necessary to prevent rickets to which these babies are very prone.

Water.—A sufficiency of water must never be forgotten, the quantity per pound of body-weight being very gradually increased to equal that which the normal full-time baby requires.

Iron is a necessary addition from the second month. It may be given in the form of the citrate of iron and ammonium, half a grain dissolved in a teaspoonful of water with five drops of the syrup of orange added, daily

The juice of cooked spinach half to one teaspoonful a day is said by Tallerman * to be able to supply the need in iron.

Quantity and Number of Feeds.—No definite rules can be laid down for the first three weeks which are the critical days of the premature baby. Each one of them must be carefully studied and fed according to its individual needs.

Artificial milk mixtures must be given in small quantities at first, beginning with one or two teaspoonfuls at a time on the second day, and increasing gradually to about one ounce feeds by the tenth day. Take great care not to distend the stomach and stop any further increase for a day or two if there is regurgitation of the food. No anxiety need be felt if the weight is stationary, for no gains can be expected till after the third week, when the food requirements can be better met.

The smaller the feed, the oftener must it be given, and ten to twelve feeds may be necessary in the twenty-four hours at first. After the tenth day the number can be reduced to six or eight.

The Weakling is one that was born at full term but has become underweight because of repeated minor illnesses, a wrong method of feeding, or simply an inability to absorb the nourishment it needs from its feeds. In the latter case, there may have been no indication in its stools that any particular constituent of the milk mixture was causing a digestive upset, but yet it does not thrive, vomits frequently, and is obviously losing

* *Prin. inf. nutrit.*, 1928.

ground. This is often due to too frequent changes in the diet. It is best in such cases to feed first on whey with sugar added and then on sweetened condensed milk diluted 1:8 and persist with it in small and frequent feeds till the stomach tolerates it, and later change to a weak peptonized dried milk.

In other cases where the nutrition alone is poor and there is no question of prematurity or signs of any upset, feeding must be pushed on in a larger quantity and with a higher value in calories to the amount required by the expected weight for its age before any gain in weight can be expected.

CHAPTER VIII

SOME DON'TS IN THE UPBRINGING OF CHILDREN

1. Do not nurse a baby whenever he cries. Teach him regular habits.

2. Never give a baby an empty feeding bottle to suck, or your fingers, to keep it from sucking its own thumb.

3. Never forget to cleanse feeding bottle and teat thoroughly after use, and to sponge your own nipples after nursing.

4. Never leave baby's milk uncovered.

5. Don't give a baby a dummy teat to suck during dentition or at any other time.

6. Don't give a baby soothing syrups, teething powders, cordials, or sleeping drops except under medical advice.

7. Don't let water trickle into the ears when baby is being bathed.

8. Never twist a towel round a pin or anything hard in order to clean out a baby's ears.

9. Do not blow on food in order to cool it; the breath is often impure and will contaminate the food.

10. Don't give a baby any alcoholic drinks or even tea and coffee.

11. Never give "tit-bits" off your table to a baby.

12. Don't rock a baby quickly in his chair or cradle.

13. Never pat a young child hard or attempt to amuse it by making startling noises.

14. Don't jerk a young child's arms in walking nor urge a baby unduly to walk.

PART II

MODERN METHODS OF ARTIFICIAL FEEDING .

CHAPTER I

THE INDICATIONS FOR, AND THE TECHNIQUE OF ARTIFICIAL FEEDING

YOU may sometimes find it necessary to bring up the baby wholly or partially on artificial food.

The regular employment of artificial feeding, however, as a substitute for breast milk can only rarely be justified. The following conditions alone may be accepted as indications for doing so :

Contra-indications to Breast-feeding.

- (a) Such poor development of the breasts that they do not function—a condition that is extremely rare, for practically every mother can nurse her infant at least partially during the first few months of its life. After the sixth month, however, if you find that the amount of the milk secretion is insufficient to meet its needs at least twice in the twenty-four hours, the baby may then safely be weaned.
- (b) Certain diseases in the mother such as tuber-

culosis, heart disease with dropsy, diabetes and Bright's disease.

(c) All mental affections.

(d) Serious infectious fevers like pneumonia and enteric fever.

Much more often will it be necessary to give one or two bottle feeds in the middle of the day because of an insufficient milk supply ; or a small quantity of a bottle feed soon after a breast feed, and as a complement to it. The latter naturally implies that the amount of nourishment obtained by the infant at each nursing is insufficient for its needs, but is much to be preferred to your weaning it, in the first few months of its life. This insufficiency may be due to *deficient quantity* or *poor quality* or both.

Signs of Under Nutrition.—When the quantity of breast milk is insufficient for its needs, the baby is seen to want to spend a longer time at the breast ; or it gives up sucking and cries as if dissatisfied. It may vomit from the sucking of air, or it may suffer from colic. After a time pallor of the face and apathy become noticeable. The true meaning of these symptoms will be furnished by the scales, for actual loss in weight may be registered, or, at any rate, a failure to gain as expected. Poorness in quality is only rarely likely to be the cause, but, if so, practically always means poorness in fat-content. Such a condition may be suspected in the mother who has to keep working hard for her living, as well as in the highly educated woman of neurotic temperament. In such cases you will have to

consider the question of giving extra nourishment. Complementary feeding must not, however, be allowed to become the routine and, in fact, the length of time it is continued depends largely on the skill of the doctor in trying to secure an adequate amount of baby's natural food. Great improvement both in quantity and quality of breast milk, can be secured by rest and freedom from worry, by a strict adherence to the methods of stimulating the breasts as advocated in Part I, Chap. II, and by attention to the general health. Lactagol—a proprietary preparation derived from cotton seed—is reputed to have an undoubted beneficial effect in increasing both the quantity and quality of human milk, and should also therefore be regularly taken.

The best artificial complementary food to give under the circumstances you can decide for yourself by considering for a moment the *composition of breast milk*. The milk of the human female is roughly composed of :

2 parts proteins, or substances that supply flesh and build up the muscles ;

7 parts carbohydrates, in the form of milk-sugar, which supply heat and energy ;

3·5 parts fats, which also supply heat and are an important source of other essential substances known as vitamins ;

A trace of mineral salts which are necessary for bone formation. Vitamins—minute substances of four varieties called A, B, C, and D, which are essential to growth and development ; and

Water to make up 100 parts.

It is easy to see, therefore, that any food used in addition to or as a substitute for breast milk will have to consist of pretty nearly the same ingredients as human milk in about the same proportions, and be just as easily digested.

These conditions are most nearly met by the milk of some other home-bred animal such as the cow or goat, subject to some modification, and that of the former is generally chosen as being more palatable and the most universally procurable. It may be given fresh if a perfectly clean and wholesome supply, above suspicion of contamination, is obtainable; or as one of the dried milks sold under so many different names. The advantages and disadvantages of these different forms of milk will be considered in the following chapters. Here it will be sufficient to inquire how you are to decide upon what extra quantity you are to give the baby, and with what modification, taking fresh cow's milk as the standard.

Complementary Feeding.—Obviously, the amount of extra milk needed by an infant will depend on the quantity it receives from the breast. The latter can only be known by means of the scales. Weigh the baby in its napkin (but with all other clothes removed) before and after every breast feed during one day. The sum of the gains made on each occasion, divided by the number of times the test was made, will give you the average quantity of milk ingested on each occasion.

The computation made on a single weighing will

give inaccurate information, because an infant draws off very variable quantities of milk at different feedings, more in the early morning and late evening and less in the forenoon and afternoon.

Now it has been found that the average normal infant requires about $2\frac{1}{2}$ ounces of breast milk for each pound of its body weight in twenty-four hours, and Hess has shown that the same requirement will be met by $1\frac{1}{2}$ ounces of cow's milk with one ounce of water added together with a level teaspoonful of sugar. Hence here you have a practicable basis for your calculation. Supposing, for instance, you find that a baby weighing nine pounds has received only $17\frac{1}{2}$ ounces of breast milk for the day. That amount is clearly insufficient and is five ounces short of the required amount, for $9 \times 2\frac{1}{2} = 22\frac{1}{2}$ ounces. Since the equivalent of five ounces of breast milk is three ounces of cow's milk with two ounces of water added, and two level teaspoonfuls of sugar, this is the quantity of extra nourishment necessary for the day, and may be divided into three or four equal portions and administered during the middle of the day directly after a breast feed—one portion on each occasion. No anxiety need be felt as to whether this extra nourishment will agree with the baby, for infants seem to tolerate the mixed feeding quite well.

If a dried milk is employed for these complementary feeds, the calculation of the amount of the reconstituted milk necessary is quite simple, and is merely the difference between the amount of breast milk

adequate for the baby's weight and the amount actually taken as determined by the scales. If a full cream dried milk of Class I (see Chap. V) is being used, it will be wiser to dilute it 2 to 1 at first. Sugar must also be added to the Class I preparations—a level teaspoonful to every 2½ ounces of the feed.

The preparation of a full bottle feed as a substitute for one or more breast feedings, is considered in the next chapter. *Substitute* feeding is, however, not recommended till the sixth month if it can be avoided, for every effort must be made to maintain a good supply of breast milk and is very often rewarded with success. As a help to this end, let the baby have five minutes' nursing at *each* breast at nursing time. Every feeding must begin with the breast given last on the previous occasion. The vigorous sucking induced thus, will be the best stimulus to the breast. The complementary artificial feed must be given soon after the nursing and rather less than the required amount, so that the breast may be taken eagerly at next feeding time.

The use of the scales cannot be too strongly enforced on every physician who attempts to include the care of infants in his professional pursuits. Haphazard methods must be severely condemned, since inaccuracy in infant feeding can prove very disastrous. It is well-nigh tragic to contemplate the way in which one food is tried after another for babies, or how thoughtlessly breast-feeding is abandoned by mothers on the ground of disagreement of their milk with the infant, because

of a want of appreciation of its needs and the application of these principles, or the lack of realizing that human milk is a complete food in itself, differs very little in quality in the average woman living in very dissimilar conditions and under varied circumstances, and cannot be improved upon by the most perfect artificial food the ingenuity of man can conceive.

The Feeding Bottle and its Care.—Success in artificial feeding demands attention not only to accuracy in calculating the needs of the infant but also to scrupulous care in the administration of the food. Two types of feeding bottle are in use, the one boat-shaped and the other upright. The bottle to be recommended must be of the type designed with an opening at both ends. At one end is the teat and somewhere in the bottle there must be a valve which admits air into the bottle to replace the milk that is taken in by the infant, otherwise a considerable amount of air is likely to be admitted to the teat and swallowed. This is prevented where there is a second opening by which the air can enter. Such types, tending to the upright form, can be more easily flushed through, and if the valve is embodied in a glass stopper, the bottle can be made to stand in hot water for the purpose of warming the feed. The efficiency of the bottle and its valve arrangement can be tested by inverting it, when the milk will be observed to fall out through the teat drop by drop.

Any air swallowed by the infant can be in part got rid of by holding it up after the feed, and it is a wise precaution to instruct the ayah to do so in every instance.

The temperature of the milk preparation must be 100° F., that is, it should feel just warm to the touch.

The feeding bottle must not be abandoned to the infant's hands but *must be held by the ayah* throughout the feed. This is necessary to prevent the milk from falling below the level of the teat which is bound to result in the swallowing of a large quantity of air, which will cause vomiting and colic. As soon as the infant has ceased from the feeding by showing indifference, the bottle should be removed and not given back even if it cries. The bottle must then be thoroughly washed in clean water after removing both teat and valve and throwing away any remnant. It, and the teat, which must be turned inside out, should next be placed in a basin of clean water to which some bicarbonate of soda has been added, until required for the next feed. Once every day, too, the feeding bottle teat and valve should be placed in a saucepan, covered over with cold water which is brought to the boil, and kept boiling vigorously for five minutes at least.

As to times of feeding, the same rules as formulated for breast-feeding should be observed. An extra feed may, however, be considered necessary in some cases during the earlier weeks, depending on the general well-being and development of the infant.

CHAPTER II

COW'S MILK AS A SUBSTITUTE FOR BREAST MILK

Cow's milk in some form is the best substitute for mother's milk when the latter is not available, but unfortunately its composition differs widely from that of human milk, and in Tropical countries there are the additional disadvantages arising from the great difficulty of securing a clean and pure supply as well as of preserving it even for a few hours, especially in the hot weather, because of its liability to go sour. In all cases, therefore, where cow's milk is used, it is recommended that an animal with a young calf be purchased and cared for in one's own grounds in order to discount these drawbacks.

The Preservation of Cow's Milk from Contamination.—

Cow's milk is a splendid soil for the growth and multiplication of disease-producing germs and especially so in a Tropical climate. The utensils used in preserving it must, therefore, be scrupulously clean and every precaution taken to prevent it from contamination. The milk should be received twice a day—early in the morning in sufficient quantity to supply the first four feeds of the day, and in the afternoon, for the last two feeds. As soon as received the milk should preferably be *scalded*, that is, it is placed in a clean saucepan over

a low fire, without stirring, till it begins to rise in a foam at the top. It is then removed and cooled rapidly, poured into a clean jug, covered over with a piece of muslin and stored in a cool place free from dust, unless the feeding mixture is prepared at once. In that case it is recommended, wherever the milk supply is not certified and not above suspicion, that the required quantity be boiled at once in the way described on page 70. Scalding, however, does not destroy the vitamins of the milk which boiling would do. The milk is now ready for the preparation of the mixture which should be made up in bulk for the requisite number of feeds intended. Each feed should be reboiled before use.

Cow's Milk and Human Milk Compared.—A comparison of cow's milk, however, with human milk shows that it will have to be considerably modified in order to make it fit for a human being :

Human Milk.				Cow's Milk:			
Protein	.	.	2	Protein.	.	.	4
Carbohydrate	.	.	7	Carbohydrate	.	.	4
Fat	.	.	3.5	Fat	.	.	3.5

It will be simplest to consider the modifications necessary in the light of the *desiderata* mentioned in the previous chapter :

(a) *The Components.*—It will be seen that they are the same.

(b) *The Proportions.*—It will be seen at once that these are different. Fat is the only ingredient that is

the same in both, but there is twice as much protein in cow's milk as in human milk and only about half the quantity of sugar (7 : 4). Moreover, though not mentioned in the above table, the kind of protein in cow's milk is different, so that the latter is apt to form large curds in the baby's stomach and cause indigestion. How then can cow's milk be made a suitable food for baby ?

Modifications of Cow's Milk for Infant Feeding

Two methods are advocated here : the one known as percentage feeding from birth on till the end of the second month ; the other by simple dilution of the milk with the addition of sugar, for infants after the second month.

1. *The Percentage Method of Feeding—Humanized Cow's Milk.*—In this method, you endeavour to so modify cow's milk that it may resemble human milk in composition. It would no doubt appear to be the ideal and most scientific method of feeding for the first nine months, but in practice it has been found quite unnecessary and has been largely given up because of the cumbersome formulæ that had to be adopted without any real gain. It is, however, the safer plan to follow in the first couple of months of the baby's life, during the most critical period of its existence, when it is adapting itself to a new environment, and taking an altogether new food, meant by Nature for quite a different thing.

A. *Modification of the Proteins.*—You have already

learned that the proteins in cow's milk are twice as much as in breast milk and are very difficult of digestion. In this method of feeding, therefore, you concentrate your attention on reducing them to the same proportion as in human milk and making them more digestible, and then attending to any necessary modifications in the other ingredients. The points to consider are :

- (i) The reduction of the proteins to as nearly as possible the proportions found in human milk.
- (ii) The diluent to be used.
- (iii) The means to render them fine and digestible.
- (iv) The prevention of any change in properties in the preparation.

(i) The 4 per cent. proteins in cow's milk can be reduced to the proportion in human milk by dilution with an equal quantity of water, but even then the part that forms the indigestible curd is nearly three times the amount found in breast milk.

(ii) The diluent. There are four substances which are generally used, the one or the other, for the purpose. These are :

- (a) Water ;
- (b) Whey ;
- (c) Barley water ;
- (d) Lime water.

(a) *Water* is generally the best diluent, for it introduces no new unknown factor.

(b) *Whey* is really milk minus the curd, and contains only a minute quantity of protein and fat but 4 per cent. of sugar. It can be easily made by adding a

teaspoonful of "rennet extract" to a pint of warm milk, breaking up the curd, and straining the whole through muslin. The filtrate is the whey. It is a useful diluent in the feeding of debilitated infants because, when used with an equal quantity of milk, without any other modification, the mixture approximates human milk in composition closely.

(c) *Barley water* contains starch and therefore is not a safe diluent before the sixth month. •

(d) *Lime water* is a good diluent in cases of vomiting, for no curd forms if it is used in the proportion of one ounce to twenty ounces of milk, but otherwise it has no advantages if the milk is boiled. On the other hand, it possesses distinct disadvantages in that it increases the "buffer value" of cow's milk which is already high, adds more calcium to the large amount already present, and favours putrefaction in the bowel. The addition of alkalis like citrate of soda and lime water to increase the digestibility of cow's milk is being largely superseded by the addition of acids such as lactic acid as possessing greater advantages.

(iii) The curd in cow's milk can be broken up into flocculent particles in many ways. The most useful and practicable methods in the home are :

- (a) Boiling ;•
- (b) Pasteurizing ;
- (c) Pancreatizing ;
- (d) The use of citrate of soda ;
- (e) The use of barley water or lime water as a diluent.

. (a) *Boiling*.—This is the simplest method for the home. The milk is boiled directly over a flame for three minutes or in a double boiler, that is, the vessel containing the milk is placed in a larger vessel containing water and the latter is heated to the boiling point and kept boiling for eight minutes. It is then removed, cooled and preserved on ice.

Boiling has one disadvantage. It destroys the vitamins, thereby altering the properties of the milk. These can be supplied, however, by the addition of cod-liver oil and of orange juice to the feeds.

(b) *Pasteurizing*.—If no special vessel is available for the purpose, the milk can be pasteurized in a double boiler by heating the water in the outer vessel to 160° F. The whole is then removed from the fire and put aside for twenty minutes, after which it is cooled and preserved in the ice-box.

(c) *Pancreatizing*.—This is effected by the use of Fairchild's peptogenic powders—a capful as supplied by the chemist to a pint of milk.

(d) *Citrate of Soda*.—This may be obtained in the form of tablets, one grain being added to the ounce of milk. It has a slight drawback if used in large doses as it tends to cause constipation.

(e) *Barley Water and Lime Water*.—The indications for these have been already considered.

B. The Fat in Cow's Milk.—Unfortunately, by diluting the milk the fat-content which in the first place was equal to that in breast milk has now been halved. Fat will have to be supplied in the form of

cream. A drachm to a three-ounce feed makes 1 per cent. and will make a sufficient addition to the proportion generally, but is not necessary if cod-liver oil is being given.

C. The Sugar in Cow's Milk.—This was originally 4 per cent. as compared with human milk and by the half-and-half dilution has been reduced to 2 per cent. A drachm of sugar to a three-ounce feed, that is roughly a little less than a level teaspoonful, will give an added 4 per cent. The kind of sugar both in human and in cow's milk is known as lactose, but the ordinary loaf or cane sugar can be used quite safely and in fact is preferable if there is any intestinal derangement, because it is absorbed more quickly.

D. The Vitamins—Change in the Properties of Cow's Milk.—It has been already stated that boiling destroys the vitamins. Hence, when boiled milk is used for infant feeding, it will be necessary to supply them. This is done by the use of cod-liver oil and orange juice.

Cod-liver oil in the form of Scott's or a 50 per cent. emulsion should be administered in amounts of ten drops a day after the first month, an eggspoonful a day by the end of the second month, a teaspoonful daily by the end of the third month, and a teaspoonful twice a day by the end of the sixth month. Ostelin is a very convenient form in which to give cod-liver oil. Two drops are equivalent in value to one drachm of the 50 per cent. emulsion.

Orange juice should be given from the beginning of

the second month, ten drops in a teaspoonful of water once a day increasing to a level teaspoonful daily at the beginning of the third month, and by a teaspoonful each month until from half to one ounce can be given daily. The juice should always be well diluted and given one hour before a feed. Tomato juice can take the place of orange juice when oranges are scarce.

E. The Need of Water Intake.—An infant requires a certain amount of fluid daily to replace that lost by the kidneys, skin, etc. In the Tropics generally, the amount required may be reckoned as $2\frac{1}{2}$ ounces per pound of body weight in the cooler months and three ounces or more in the hot weather. The necessary deficit, if less than that quantity is contained in the feeds, must be made up by water administered in the intervals between the feeds.

Amount of Feed.—This is based on the average capacity of the infant's stomach at different ages. The table below shows this :

Age of Infant.	Amount of each feed in ounces.
At birth	1 ounce
End of 1st week	$1\frac{1}{2}$ ounces
End of first month	2 ounces
End of second month	3 ounces

From the end of the third month, an ounce extra is taken per month till the end of the eighth month, at which time an increase of only half an ounce is made, making $8\frac{1}{2}$ ounces per feed, which should remain the maximum. This table can be quite easily remembered.

Milk Formula for the First Two Months.—During the first few weeks of life the utmost caution is necessary in drawing up a scheme of artificial feeding, and only weak milk formulæ must be used even though they are of less nutritive value than what is requisite, till it is clear that all is well. A stronger mixture can then be more rapidly introduced to meet the infant's needs for its age and weight.

The table below gives a tentative scheme for this period :

Age.	Bolled milk per day in ounces.*	Bolled water per day in ounces.	Dilution.	Number of feeds per day.	No of ounces per feed.	Sugar in level tea-spoonsful per day.
3rd, 4th and 5th days .	1½	0	1 : 4	Seven, that is six by day and one night feed.	1	1
6th and 7th days .	3	0	1 : 3		1½	2
2nd week .	3	0	1 : 3	„	1½	3
3rd and 4th	4	12	1 : 3	„	2	4
5th and 6th	4	8	1 : 2	Six ; no night feed.	2	0
7th and 8th weeks .	7½	7½	1 : 1	„	2½	8

The vitamins must further be added—cod-liver oil and orange juice after the first month. If these quantities do not meet the needs of the baby, and its nutrition suffers, an extra feed may be given during the day by

* These measures are given in ounces because it is intended that a glass measure should be used. A tablespoon varies so much in size that it may measure more or less than half an ounce. Extreme accuracy is necessary in infant feeding.

lessening the intervals between the feeds ; or some fat may be added in the form of cream, if there are indications of a deficiency in that respect. But generally the cod-liver oil administered in the way indicated will supply that need. In rare cases, a baby may have a definite idiosyncrasy to cow's milk. In such a case, the artificial food Almata may be tried (see Chap. V).

2. Feeding by Simple Dilution of Milk with Carbohydrate added.—This method is recommended after the second month and is based on the researches of Hess, who has found that $1\frac{1}{2}$ ounces of cow's milk with the addition of 1 ounce of boiled water and $\frac{1}{10}$ ounce of carbohydrate in the form of sugar or dextri-maltose, per pound of body weight of the infant, is sufficient for its needs.

An infant weighing 11 pounds, therefore, should have, according to this formula, $16\frac{1}{2}$ ($11 \times 1\frac{1}{2}$) ounces of cow's milk, 11 ounces of water, and $1\frac{1}{10}$ ounces of sugar. The mixture will measure $27\frac{1}{2}$ ounces. Calculating the water requirement at $2\frac{1}{2}$ ounces per pound of body weight, a total quantity of fluid of $27\frac{1}{2}$ ounces will be necessary. Since this full amount is provided for in the mixture already prepared, no more water need be added therefore. The milk mixture of $27\frac{1}{2}$ ounces will be administered in six feeds of $4\frac{1}{2}$ ounces each.

Cod-liver oil and orange juice will form part of the dietary in accordance with the simple instructions already laid down. Any further liquid found necessary in the hot weather should be given between the feeds.

All milk formulæ in artificial feeding must, however,

be looked upon as experimental. Some infants will require more and some less. Careful observation as regards the general well-being of the infant and a steady rise in the weight curve are the criteria by which you may judge whether the feeding is a success.

Another point to be noted is that the preparation of a milk mixture based on the weight of the infant, will mean that the fat baby will be over-fed, and the lean baby will receive too little. In such cases, it is a wise plan to feed the latter by a *mean* between the amount it ought to have according to its age, and the amount based on its weight.

*Summary of the Preparation of Milk Mixtures after
the Second Month*

1. The infant's weight being known, calculate the amount of cow's milk you will require for the day on the basis of $1\frac{1}{2}$ ounces for each pound of body weight.

2. Calculate the water to be added on the basis of one ounce per pound.

3. Weigh out the sugar to be added on the basis of $\frac{1}{10}$ ounce per pound or a level teaspoonful. If more than $1\frac{1}{2}$ ounces of sugar are necessary on this calculation, it is better to supply the extra in the form of barley water, as too much sugar is apt to upset the digestion and cause diarrhœa.

4. Mix and measure the amount of the mixture.

5. Determine the number of feeds to be given (six up to the end of the 6th month and five after that) and the amount per feed according to the age (see p. 72).

6. If there is any deficit in the bulk required, supply that amount by the addition of water, if the water requirement is greater than the total bulk of the milk mixture already measured.

7. Calculate the water requirement on the basis of $2\frac{1}{2}$ ounces generally and three ounces in hot weather, per pound of body weight.

8. Administer cod-liver oil in the feed, and orange juice (diluted), one hour before the feed, in the amounts already prescribed (see p. 71).

Example.—Four months old baby weighing 12 pounds.

Cow's milk required	=18 ounces ($12 \times 1\frac{1}{2}$)
Water to be added	=12 ounces
Sugar to be added	=12 level teaspoonfuls
Amount of this mixture	=30 ounces
Number of feeds required	=6
Amount per feed	=5 ounces
Requirement of fluids per day	
at $2\frac{1}{2}$ ounces per pound	=30 ounces.

The bulk of the mixture is therefore adequate to meet the required amount of fluid which the infant ought to receive and is given in six feeds. If vomiting should supervene on such a mixture, the basis of calculation should be lowered to, say, one ounce of cow's milk per pound of body weight or smaller quantities administered in greater concentration, or a teaspoonful of water in the mixture may be replaced by a teaspoonful of lime water.

Milk Formula from End of Second Month to End of Sixth Month.—Prepare the milk mixture on the basis

of $1\frac{1}{2}$ ounces of cow's milk per pound of body weight with $\frac{1}{10}$ ounce of sugar added for each pound as detailed in the foregoing paragraph. The number of feeds for the day must still be six as before.

Calory Value of the Dietary—A Check on its Nutritive Sufficiency.—Naturally, if the basis of calculation is lowered or the infant is not thriving, one would like to know whether its needs as regards proteins, carbohydrates, and fats are being sufficiently met to furnish the requisite amount of energy. This calculation is also quite simple and well within the ability of the intelligent mother.

It has been stated that the healthy infant requires $2\frac{1}{2}$ ounces of breast milk per pound of body weight.

The composition of human milk is—

Proteins, 2 per cent ;

Carbohydrates, 7 per cent. ;

Fat, 3.5 per cent. •

Another way of expressing this is : In 100 cubic centimetres (written c.c.) of human milk, there are—

Proteins, 2 grammes (written grm.) ;

Carbohydrates, 7 grammes ;

Fats, 3.5 grammes.

Since the infant requires $2\frac{1}{2}$ ounces per pound, expressed as above, its needs can be said to be—

Milk.	Proteins Grm.	Carbohydrates Grm.	Fats Grm.
75 c.c.	1.5	5.25	2.6
$(2\frac{1}{2} \times 30 *)$	$(\frac{2}{100} \times 75)$	$(\frac{7}{100} \times 75)$	$(\frac{3.5}{100} \times 75)$

* 30 c.c.=1 ounce by measure.

30 grm.=1 ounce by weight.

Similarly we have seen that cow's milk contains in 100 c.c., proteins, 4 grm.; carbohydrates, 4 grm.; and fat, 8.5 grm.

Therefore, in $1\frac{1}{2}$ ounces of cow's milk, which has been stated to be roughly equivalent to $2\frac{1}{2}$ ounces of breast milk, there will be—

	Proteins. Grm.	Carbohydrates. Grm.	Fats. Grm.
Cow's milk 45 c.c.			
$(30 \times 1\frac{1}{2})$	1.8	1.8	1.5

If 3 grm. of sugar, that is $\frac{1}{10}$ ounce, are added, it will be seen how close will be the similarity to the proportions in breast milk; that is why this amount of cow's milk has been chosen as the minimum need of an infant per pound of its body weight. The calorie * value of this minimum is proteins 7.2,

1 grm. of protein yields 4 calories,

1 grm. of carbohydrate yields 4 calories,

1 grm. of fat yields 9 calories;

that is (4×1.8) ; carbohydrates 19.2 $(4 \times 1.8 + 12$; *i.e.* 3×4 , the 3 being the added grammes of sugar); and fats 13.5 (1.5×9) . This makes a rough total of 40, which, with 3 calories furnished by the salts in milk, made 43 calories or very nearly the 45 calories said by Heubner to be necessary to maintain equilibrium in the infant. Knowing, therefore, the amount of milk the baby is being given, it is quite easy from these tables to determine whether it is receiving the right amount of proteins, carbohydrates, and fats to main-

* A calory is the amount of heat required to raise a gramme of water by weight to a degree of temperature on the Centigrade scale.

tain health as well as the full energy value of 45 calories per pound of its weight. To take an example: suppose a baby weighing nine pounds is being fed with twelve ounces of milk, six ounces of water, and one ounce of sugar per day, and three ounces of this mixture are being given at each of six feeds.

Now the calorie value of this bottle feeding per day is 12×20 for the milk * and 30×4 for the sugar.† This makes a total of 360. But the calorie needs of the infant, at 45 for each pound, are $9 \times 45 = 405$ calories per day. It can therefore be seen at once that the infant is being underfed. But more than this, it can be readily found that in sugar at least there is no deficit. On the other hand, the amount is a trifle over the required quantity, for it has been pointed out before that $\frac{1}{10}$ ounce of sugar for each pound weight is what a baby needs.

Diet after the Sixth Month and up to the End of the Ninth Month.—This is the period when the first changes in the diet can be made with safety by the addition of cereals. The feeding can be conducted on the same lines as prescribed for the breast-fed baby (see Part I, Chap. II). The number of feeds per day are reduced to five and are given at four hourly intervals. The amount per feed may total $8\frac{1}{2}$ ounces towards the latter part of this quarter year, that is, so long as the

* An ounce of cow's milk or of breast milk is reckoned to furnish 20 calories, and a drachm of dried milk powder is also reckoned to furnish 20 calories.

† One ounce of sugar is 30 grammes and each gramme gives 4 calories of heat.

fluid requirement for the day is not exceeded. How the diet can be drawn up is shown in Table I.

Diet from Nine to Twelve Months.—The farinaceous food, already referred to, should be slowly increased until the full amounts permissible are being taken by the infant at three of its meals. As the first year draws to a close, however, it must be partially replaced by other more or less solid food; for milk-jelly and junket, the yolk of a lightly boiled egg, a teaspoonful of mashed potato, milk puddings, stale bread thinly buttered, and a rusk may form part of the diet, the egg yolk being given only two or three times a week. As a general rule, alcoholic drinks of any kind should not be allowed during the first year, nor any tea, nor coffee; but a bottle feed of weak cocoa is permissible. It can be made by dissolving a level teaspoonful of some patented cocoa powder or Schweitzer's cocoatina (this contains very little fat, which may be an advantage) in half a pint of boiling milk and water (equal parts), with sugar added to the usual amount. Thin and underweight infants often improve remarkably on such a preparation. According as more solid food is given, the quantity of milk at a feed should be reduced. The juice of half an orange and two teaspoonfuls of cod-liver oil must continue to be administered daily.

Table II gives a summary of feeding during this period.

Diet in the Second Year.—Weaning from the bottle may now be begun and should be completed by the fifteenth month. The child must be taught to take

its food from a cup. Milk will again form an important and the main part of the diet, but other substances like eggs, toast, butter, honey, bacon, fruits, and finally flesh food can now be gradually introduced into the dietary. It is most important that these additions be made one at a time and in small quantity at first, the effect being carefully watched before any increase is made. The number of meals must be reduced to four and given at four-hourly intervals, but the last meal for the day must be light. Vitamins, especially cod-liver oil, should be administered throughout the second year.

Diet from Two to Six Years.—During this period the diet of the young child can be more varied and more like that of its elders. There is a tendency to give too much carbohydrate at this age in the form especially of bread or rice. Carbohydrates must not exceed 50 per cent. of the total energy value of the diet, however, the other 50 per cent. consisting of one-third protein and two-thirds fat. Oatmeal porridge, minced meat, chocolate, marmalade, jams, and fresh fruit and tea can form part of the diet, but with all this varied food take care that there is no overfeeding. The times of feeding can also be altered somewhat to suit the arrangements of the home without a rigid adherence to the four-hour regime, but nothing should be allowed in the intervals between the feeds except water. The vitamins will be sufficiently supplied by butter, fresh vegetables, and fruit.

TABLE I

DIET BOTH FOR BREAST-FED AND BOTTLE-FED BABIES FROM SIX TO NINE MONTHS OLD

Weight 15 to 18 pounds

Amount of Cow's Milk not to exceed 30 ounces

6 a.m.	10 a.m.	2 p.m.	6 p.m.	10 p.m.
Breast milk or cow's milk mixture: <i>i.e.</i> cow's milk, 6 oz.; water, 2 oz.; sugar, $\frac{1}{4}$ oz.; orange juice, $\frac{1}{4}$ oz. diluted and sweetened with a level teaspoonful of sugar.	1. Breast milk or cow's milk mixture: <i>i.e.</i> cow's milk 6 oz.; water, 2 oz.; sugar, $\frac{1}{4}$ oz. 2. One tablespoonful of gruel or a heaped teaspoonful of cereal (Part I, p. 14). 3. One teaspoonful cod-liver oil.	1. Cow's milk mixture for breast-fed baby (see p. 13) and for bottle-fed baby. 2. Vegetable broth, a tablespoonful as an extra. 3. $\frac{1}{4}$ oz. orange juice diluted and sweetened with level teaspoonful of sugar.	1. Breast milk or cow's milk mixture, 2. Additions as at 10 a.m.; or for bottle-fed baby, instead of (1) and (2), cereal made with 6 oz. milk and 2 oz. water, and sugar added and given as bottle feed; or a malted food. 3. Cod-liver oil, one teaspoonful.	Breast milk or cow's milk mixture: <i>i.e.</i> cow's milk, 6 oz.; water, 2 oz.; sugar, $\frac{1}{4}$ oz.

TABLE II

DIET FOR INFANT FROM NINE TO TWELVE MONTHS OLD

Weight 18 to 21 pounds

6 a.m.	10 a.m.	2 p.m.	6 p.m.	10 p.m.
1. Six ounces milk with one level teaspoonful of sugar. 2. A tablespoonful of bread crumbs or a rusk broken up and well soaked in the milk. 3. A tablespoonful of orange juice.	1. Six ounces milk with one level teaspoonful of sugar. 2. Two teaspoonfuls of Scotch oatmeal, or two tablespoonfuls of gruel (see Part I, p. 14), or a teaspoonful of egg yolk three times a week. 3. Four drops of ostelin.	1. Eight ounces of a malted food. 2. Two tablespoonfuls of a vegetable broth, or of a vegetable purée. 3. A tablespoonful of orange juice.	1. Six ounces milk, or weak cocoa and milk. 2. A cereal (see Part I, p. 14), or a milk pudding or junket. 3. A tablespoonful of stewed apples or prunes.	1. Four ounces milk with a level teaspoonful of sugar; and four drops of Ostelin.

TABLE III

DIET DURING THE SECOND YEAR

7 a.m.	11 a.m.	3 p.m.	7 p.m.
<p>1. Milk 6 ounces with a biscuit or a plain rusk, or two tablespoonfuls of a cereal such as oatmeal with milk.</p> <p>2. Small rasher of crisp bacon with thin slice of toast lightly buttered, or a lightly boiled egg on alternate days.</p>	<p>1. Finely minced chicken, brains, or steamed fish—one tablespoonful.</p> <p>2. A small mashed potato with gravy or meat juice and a vegetable purée of spinach or carrots.</p> <p>3. Custard pudding, a tablespoonful, with three ounces milk poured over; or three ounces milk-jelly; or junket.</p> <p>4. Stewed prunes or apples—a tablespoonful.</p> <p>5. A drink of water.</p>	<p>1. Six ounces milk, or cocoa and milk.</p> <p>2. A thin slice of bread and butter with honey; or a plain cake.</p> <p>3. A mashed plantain.</p>	<p>1. Four ounces milk. This may be given as a pudding or as junket, if preferred.</p> <p>2. A tablespoonful of stewed fruit.</p>

Fresh raw fruit may be given during the latter half of the second year, and the minced chicken and mashed potato at the 11 o'clock feed may be replaced by two tablespoonfuls of boiled rice, with minced curry and tomato or spinach vegetable thoroughly mashed.

TABLE IV

DIET FROM TWO TO SIX YEARS

8 a.m.	12 noon	3.30 p.m.	7 p.m.
1. Oatmeal porridge with four ounces milk. 2. Crisp bacon or half to one egg. 3. Slice of toast and butter.	1. Minced chicken or lamb or fish. 2. A mashed potato. 3. A tablespoonful of fresh vegetables, or instead of (1), (2), and (3), two tablespoonfuls of rice and curry. 4. Two tablespoonfuls of stewed fruit, or a fresh fruit. 5. Six ounces milk.	1. Slice of toast with butter and jam or treacle. 2. Cup of weak tea and milk or chocolate. 3. Piece of plain cake or a biscuit.	1. Four ounces milk. 2. Custard or other pudding. 3. Tablespoonful of stewed fruit.

(38)

If the child wakes early the juice of an orange or five ounces milk may be given.

CHAPTER III

GOAT'S MILK

GOAT's milk is very popular among some classes of the indigenous population of Ceylon as a substitute for breast-feeding, and is credited by them with almost curative properties in infantile ailments. There is, however, no essential difference between its composition and that of cow's milk.

The *protein* content is very similar ; it is higher than in human milk and forms large dense firm clots in the baby's stomach, even more so than the milk of the cow does. It must therefore be made more digestible by one of the methods already considered.

The *sugar* is practically in the same proportion but of course is therefore less than in breast milk.

The *fats* exist in larger proportion than in both human as well as cow's milk, averaging 4.5 per cent. Since it is the fat of cow's milk that the infant's stomach is most intolerant of and the cause very often of digestive upsets, it might be thought that goat's milk with its even larger fat content was much less suitable as a substitute for breast milk ; but that is not so, for the fat globules in goat's milk are small and exist in fine droplets as in human milk, so that they are easier of digestion.

On the whole it may be said, therefore, that goat's milk is a better substitute than cow's milk for infant feeding. It has further advantages which make it still more desirable in certain cases :

The goat is immune to tuberculosis and therefore there can be no danger in giving it raw ; the raw milk is further safe as it need not be exposed to contamination between the time of milking and use, since the goat can be purchased cheap and kept in one's own compound. The increased acidity of goat's milk, too, protects it from bacterial contamination. All these are advantages that cannot be gainsaid in all Tropical countries with their great humidity and high temperature which so favour bacterial growth and the souring of milk. Since goat's milk can be given unboiled, there is no danger of any lack of vitamins and it is further said to have a high antiscorbutic value. Another probable advantage is that the fat droplets rise only very slowly to the top so that no cream layer is formed and the milk cannot be skimmed.

Remember, however, that goat's milk must always be modified owing to what has been already stated about the protein content and the insufficiency of sugar.

The disadvantages are the peculiar taste and the rather unpleasant smell, but one is hardly conscious of this where the udders have been thoroughly washed before the milking and when the goat-sheds are kept scrupulously clean.

CHAPTER IV

CONDENSED MILK

CONDENSED milk is manufactured in two forms, sweetened and unsweetened.

1. *Sweetened Condensed Milk*, of which the milkmaid brand is very popular in Ceylon, is made by heating fresh whole cow's milk to boiling-point, and then drawing it by suction into large vacuum pans. During the process of evaporation in these, sterilized sugar solution is added. Evaporation takes place under reduced pressure at a low temperature until the 87 per cent. of water in cow's milk is reduced to about 26 per cent.

Advantages and Disadvantages.—Though not absolutely sterile, sweetened condensed milk is practically free from disease-producing microbes. It is, therefore, a safe food in a hot country and owing to the added preservative is suitable for use on a journey such as a sea-voyage. The vitamins are to a certain extent destroyed by the process of boiling and so must be supplied. When there are digestive disturbances owing to a failure to deal with the protein of cow's milk and the nutrition suffers, condensed milk proves valuable and overcomes the trouble, but on the other hand, owing to the high sugar content, there is danger that

the curd-indigestion may be changed for carbohydrate indigestion with flatulence, colic, disturbed sleep and green stools.

For instance, the percentage composition shows about nine parts each of protein and fat and fifty-four parts of sugar, so that the latter is far too high while the protein and fat are too low; this is especially seen if the milk is diluted so as to reduce the sugar to the proportion found in breast milk, for then the protein and the fat are extremely low, only about 1 per cent. When used for too long a time even with a make-up of the deficiencies, although the infants may get fat and seem to thrive, they are flabby and very liable to develop rickets and scurvy and show less resistance to infection.

Its Place in Infant-feeding.—From the above, it will be seen that sweetened condensed milk should never be used for the feeding of the normal child. It is very useful as a temporary measure, however, when the fat and protein of cow's milk cannot be digested as it is easily digestible and so, readily tolerated, because the protein has been altered in the process of manufacture. It is also useful for the feeding of premature infants.

The milk is prepared for infant feeding by pouring it into a half-ounce measure and adding $2\frac{1}{2}$ ounces of boiling water. It may be given in this quantity for every pound of weight of the infant in accordance with its water requirement, but is, then, of course, of poor nutritive value. Fruit-juice and cod liver oil must be given in addition, and when required the fat and protein content may be increased by the addition of a little cow's milk.

2. *Unsweetened Condensed Milk—the “Ideal” Brand.*—

Here the full-cream cow's milk is concentrated in vacuum pans without any added sugar. It is then filled in tins, sealed and sterilized in the autoclave for a quarter of an hour. In the tin therefore it keeps indefinitely.

Advantages and Disadvantages.—The “Ideal” milk possesses the same advantages of sterility and digestibility as sweetened condensed milk and is much more desirable as a food since its sugar content is low and there can be no fear of a digestive upset from carbohydrate indigestion. Its one disadvantage is that a fresh tin will have to be used daily as it soon turns sour when once the tin is opened because no preservative has been added.

Its Use in Infant Feeding.—The “Ideal” milk occupies just the same place as a substitute for breast milk as sweetened milk does. It is the better product to use since sugar can be added to the necessary amount. Vitamins must be supplied as before. Diluted 1 in 4 with a teaspoonful of sugar added it resembled breast-milk in composition. The amount required per feed, therefore, when thus diluted, is just that of breast milk. On the whole it may be said, therefore, that condensed milk has a distinct place in infant-feeding if used with an intelligent appreciation of its composition and properties and of the conditions for which it is suited.

CHAPTER V

DRIED MILK

DRIED milk is merely cow's milk which has been dried down to a powder, from one ounce to one dram by getting rid of the fluid. This is done in one of two ways : either by pouring the milk over revolving drums, raised to a high temperature by superheated steam, so that the milk forms a thin film on their surface in three seconds and is scraped off mechanically ; or by spraying the milk into a heated chamber, so that the fluid portion evaporates and the dry powder falls as a fine snow on to the trays at the bottom.

There are several varieties of these milks on the market. Only those procurable in Ceylon at the present time will be considered here. They are undoubtedly the most popular substitutes for breast-feeding in this country, over 1,500 cases being imported monthly. In fact they have met with so much success in infant-feeding that there is a great danger in mothers believing them to be just as efficacious as breast milk in the rearing of their infants, and adopting them for that purpose on the slightest pretext, because they have heard that So-and-so's baby has been brought up on one or another brand. This is a great mistake, and I am afraid the

profession is much to blame in not consistently upholding the superiority of Nature's food for the baby which can never be replaced with safety.

As regards composition, some slight modification of the protein, carbohydrate or fat content of the cow's milk used, is made in very many of them before the process of manufacture; but at any rate the dried product has a great advantage over the natural cow's milk in that the protein is much more digestible; and unfortunately a disadvantage as well, in that there is a possibility of the vitamins being more or less lost; further, although, as successful foods, there is apparently no difference in the milks manufactured by the two processes mentioned above, Barton * has called attention to the fact that the fat of those made by the "roller" process tends to rise in little masses in the feeding bottle which you must therefore remember to shake up every now and again to prevent baby from taking it all at the last. The protein, however, is very fine, indeed. Just the reverse of this is seen in the varieties of milk manufactured by the "spray" process.

As put up for sale, the different brands procurable in the Tropics may be divided into two classes: those which, when mixed with water, are practically reconstituted cow's milk; and those which are "humanized," and therefore resemble breast milk in composition when the feed is made up.

Class I—Dried Milk Foods resembling Cow's Milk in Composition when Prepared.—Glaxo ($\frac{3}{4}$ cream); Cow

* *Infant Feeding*, 1925.

and Gate ($\frac{3}{4}$ cream); Ambrosia (full cream); Homogen (full cream).

Emphatic attention must be called here to the fact, which never seems to be realized, that feeding with the above foods of Class I, is practically the same as giving whole cow's milk to the infant without any dilution, if prepared according to the directions on the tin, so that there is a danger of overfeeding.

It will be noticed that the Glaxo and the Cow and Gate milk contain a rather less amount of fat than the other two preparations. I have been informed by the agents of those two products that the $\frac{3}{4}$ cream will be the only strength exported to the Tropics in future as having been found generally most satisfactory. In cases of trouble with the digestion of fats therefore, their modified fat content should prove a point in their favour.

Advantages and Disadvantages.—These dried milks are sterile and free from disease-producing bacteria and really mean the cow brought to the cupboard as some one has aptly remarked. On that account they are much to be preferred to cow's milk in Tropical cities and towns at any rate, where a good supply of the latter above any suspicion of adulteration or contamination is almost impossible to procure. They are always to hand and can be prepared in a few minutes, so that there is no risk of contamination by keeping, or of souring by the heat. They are easily digested and babies often thrive on them when cow's milk and even peptonized milk disagree. Their composition hardly varies, whereas

a very variable richness may be the outcome of the difficulties of pasture in the Tropics. On the other hand, their possible lack of vitamins is a disadvantage. This can be easily remedied, however, by the administration of cod-liver oil, or Ostelin, and orange juice. A preparation of Glaxo called the New or Humanized Glaxo has been just put on the market which is claimed to contain the vitamin D, which prevents rickets, in sufficient quantity. I understand it will presently be the only preparation sent to Tropical countries by that firm. It should prove superior to the older product; and will be included among those of Class II.

Uses.—These preparations are most useful when breast milk is not available, but should never replace it unless absolutely necessary. They may also be used when complementary feeds are necessary and at the time of weaning, if a good supply of cow's milk is not available.

Preparation and Amount of Feed.—One dram or a heaped teaspoonful dissolved in an ounce of hot water makes one ounce of what is really cow's milk. It has already been pointed out that dilution to human milk standard is not generally made. During the first two months of baby's life, however, it is wiser to dilute the reconstituted milk when prepared, in the proportion of two parts to one of water as in some cases an upset of digestion otherwise does take place. The amount necessary for the day will, therefore, be calculated on the basis of the amount of breast milk a baby requires. This we have seen (Part I, Chap. II) is $2\frac{1}{2}$ ounces per pound of body-weight,

so that $2\frac{1}{2}$ ounces of the reconstituted milk will meet the condition. In other words, the baby requires two heaped teaspoonfuls and a half, dissolved in as many ounces of water for each pound of his body-weight per day. Sugar must be added to the amount of a level teaspoonful for each pound of the weight. Cod-liver oil and orange juice must be given as directed in Chapter II. The amount per feed can be easily calculated from the number of feeds given in the twenty-four hours (see Part II, Chap. III, p. 75, also Part I). Should any symptoms of over-feeding appear, reduce the quantity of the dried milk to 2 or even $1\frac{1}{2}$ teaspoonfuls per pound of body-weight; make this up, however, as before with water to the amount of $2\frac{1}{2}$ ounces per pound of body-weight per day.

It is, of course, understood that, in this method of calculating the amount of food required, the baby will be regularly weighed.

Class II—Humanized, Dried Milk.—These include Lactogen, Allenbury's foods No. 1 and No. 2, Humanized Trufood, the New Humanized Glaxo and Almata.* As the name implies the mixing of these with water produces a liquid nearly identical with breast milk in composition.

The Allenbury's foods have less protein and fat than the others, but are richer in carbohydrates, some of

* Almata is a complete food manufactured from egg-yolk, butter fat, malt-dextrin, and fresh fruit juice. It is not a milk preparation, therefore, but is included here as it closely resembles human milk when prepared. It is said to contain the vitamins A, B, C, and D in full amount.

which is in the form of dextri-maltese and should, therefore, really be included in Chapter VI.

Advantages and Disadvantages.—These milks possess the same advantages and disadvantages as those discussed under Class I. They are more expensive. The approximation to human milk in percentage composition is not now considered a very decided advantage, as other factors, such as the nature of the protein, are necessary to make a food suitable, but may be a factor occasionally in making these preparations more suitable in the earlier weeks of bottle-feeding.

Uses.—They may be used in the same way as the Class I preparations. The effect of the slight excess of carbohydrates in Allenbury's must be watched, but may be of decided benefit in special cases. The smaller protein content of these preparations may be an advantage when there is a difficulty in digesting that ingredient.

Mode of Preparation and Amount of Feed.—A heaped teaspoonful dissolved in an ounce of hot water makes a liquid approximately like breast milk. As $2\frac{1}{2}$ ounces of the latter are required by an infant for each pound of its weight, two heaped teaspoonfuls and a half must be used for every pound weight for each day, and enough water added to give a water equivalent of $2\frac{1}{2}$ ounces per pound. Thus a baby weighing 9 pounds requires $9 \times 2\frac{1}{2}$ heaped teaspoonfuls of the powder a day and enough water added to make a measure of $9 \times 2\frac{1}{2}$ ounces of liquid, that is $22\frac{1}{2}$ ounces. *Sugar must not be added*, but orange juice and cod-liver oil will have to be given from the second month as usual.

CHAPTER VI

MALTED FOODS

Horlick's malted milk.	Mellin's food.
Glaxo malted food.	Benger's food.
Allenbury's malted food	Savory and Moore's food.

No. 3.

THE one common outstanding feature of these preparations is the large amount of carbohydrate they contain, which renders them unsuitable for the routine feeding of infants from birth. In most of them the carbohydrate is in a soluble form, however—the products of malting—so that there is no objection to their use on the ground of the presence of unconverted starch. In Benger's food, Savory and Moore's food, and Allenbury's malted food, however, there is still some starch unconverted into the soluble form even after preparation. This must be considered an advantage rather than otherwise when starch-feeding the baby has begun after the sixth month. Benger's food besides is able to partially digest the milk with which it is mixed.

With the exception of Horlick's malted milk, which is a desiccated milk, with barley malt and wheat flour added, the rest are not intended to be substitutes for cow's milk but only as additions to it. As such there-

fore they serve a very useful purpose when used with intelligence and a thorough knowledge of what is required.

Mellin's food is particularly useful when a laxative effect is desired, and it also seems to assist the digestion of milk sometimes. Being practically a malt extract, it may also be used as a substitute for dextri-maltose when that preparation is desired to increase the carbohydrate content of a diet in certain disorders of nutrition. Still has shown that a heaped teaspoonful added to a three-ounce mixture of milk and water will add 5 per cent. carbohydrate to that already present in the milk.

On the whole it may be said that, although babies may sometimes thrive on these patent foods when they fail to gain weight on an ordinary milk mixture or are unable to digest the ordinary white cane sugar put into their food, they are not really necessary for the normal healthy baby if fresh milk is available, and cost more. Because of their high carbohydrate content, there is a tendency to overfeeding and they may, in a few cases, therefore upset the digestion. If used, however, as a routine, the administration of cod-liver oil and orange juice in addition must not be forgotten.

CHAPTER VII

THE STOOLS OF THE BOTTLE-FED BABY—AN INDICATION FOR CHANGE IN THE COMPOSITION OF THE MILK MIXTURE

ALL babies vary in their needs and use of food. Therefore, success in infant-feeding depends on your interpreting aright the requirements for and the tolerance of the various constituents of the individual baby's food—protein, fats, carbohydrates and salts. Changes in the quantity of the food or in one or another of these constituents will have to be made in the presence of digestive disturbances. I propose in this chapter to group together the symptoms that each substance may produce as evidence of its abnormal action and an indication for change. The medical man must be the best guide in this.

Any change made must, however, be made for a definite reason and in no haphazard manner. At the same time, do not be hurried or flurried into making too frequent changes without a thorough trial of one, for such action can only result in clouding your mind, so that you lose all sense of correct interpretation.

Normal Stools of the Bottle-fed Baby.—As has been stated in an earlier chapter, the hand-fed baby passes only one or two stools a day and may sometimes skip a day. In other words, it is likely to be constipated,

especially if the amount of sugar added to the milk is small.

When Cow's Milk forms the Diet, the stools are of a pale yellow colour, neutral or more often alkaline in reaction, and firm, and have rather a musty odour. This is because the proportion of protein to fat and sugar is high in such a diet. If fat and sugar are in greater proportion, the stools become acid and tend to be loose.

When Baby is Fed on one of the Dried-milks, the colour of the stools is about the same, but they are not so firm, and they have a dull appearance, somewhat like lard. This may vary, however, according to the variety, whether a full-cream without dilution, a three-quarter cream, or a "humanized" dried milk is being used.

I. Protein.—This is the substance that builds bone and muscle and promotes growth. All methods of infant-feeding must therefore be drawn up on the basis of a definite quantity of this, namely, that contained in $1\frac{1}{2}$ ounces of cow's milk per pound of body-weight, as it cannot be replaced by any other constituent of the food. Too low a proportion will make baby flabby and anæmic. A high proportion is not so harmful unless long continued, for all babies tolerate protein the best.

Excess of Protein.—Too much protein in the diet is not marked by any symptoms for a long time, if digestion is good; when symptoms do appear, they are more likely to point to a nutritional disturbance. The complexion is of a muddy hue, the infant does not

gain in weight and is apt to be constipated and pass hard curds which appear grey with a shiny surface if cut into, the stools sometimes containing hard curds. Boiled cow's milk may produce such stools if given undiluted with the cream removed because the proportion of protein to fat is too high.

If the excess of protein is continued, other symptoms will arise which show that the body is being poisoned because of errors in digestion and absorption. These are—

- (i) loss of appetite ;
- (ii) bad breath with a coated tongue ;
- (iii) sour vomiting, after, between or before the meals, the vomiting consisting of large hard curds ;
- (iv) colic ;
- (v) loose stools up to four or five a day. These may have a greenish or yellowish appearance and contain mucus with casein curds.* After exposure to the air, the latter will become slimy masses.

Remember, however, that the mere presence of protein curds in the stools, does not necessarily mean protein indigestion ; in the latter condition the stools are dark in colour, alkaline in reaction (that is a red litmus paper dipped in them is turned blue) and have an offensive odour. They may be loose or constipated.

The addition of carbohydrate to the diet helps to

* Casein curds are not seen where dried milk is used, as the protein has been changed and become more easily digested.

regulate the digestion and absorption of proteins and will change such stools to a more normal appearance.

Treatment.—Make a nice balance between the protein and the fat in the diet. The protein can be reduced and the fat increased by giving whole “top” milk which contains most of the cream; or give a mixture of cream and whey, or condensed milk.

Grover * has pointed out that the feeding of a baby with boiled milk after removing the cream is a sure way of deciding whether a diarrhoea is of the infectious type; if not, the stools will readily change in character and assume the appearance of gloss as described above without mucus or blood. You can thus be pretty sure that the diarrhoea was only caused by a mild fat or carbohydrate indigestion or by some infection elsewhere in the body, such as the throat or ear, but not in the bowel.

II. *Fat.*—Fats act in unison with carbohydrates and tend to produce an acid reaction in the stool as may be tested by a blue litmus paper. In normal amount it has a laxative action on the bowels. Fats are digested for the most part in the upper portion of the small bowel. They are the most likely component of the food to cause a digestive upset.

The “Soap” stool in Excess of fat.—Two to three per cent. of the milk formula in fats is about the highest amount that can be tolerated by the infant.

When the fat in the formula is high, and the protein low, there is constipation and the stool is known as the

* J. A. M. A., Vol. I, 1921.

"soap" stool. Such a stool is formed, dry and crumbly and of very light colour. It is acid in reaction. It appears smooth and dull when spread out with a spatula. It is useful for you to remember that these soap stools generally turn green on the outside after exposure for a few hours.

Other Symptoms.—Excess of fat in the milk formula delays digestion in the stomach and hence one of the earliest symptoms is sour vomiting which occurs at first after and then before the feeding. *The vomited matter* in this case consists of *fat-curds*. They are seen as small particles or soft masses that may be as large as a mangosteen bulb. *The stools* are acid, loose, green in colour, and contain numerous soft white masses with a good deal of mucus surrounding them. These are fatty-curds. At the same time, the appetite is lost, a good deal of gas is produced in the bowel, and there is a failure to gain in weight. This is the fermentative type of stool which is also seen when *excess of sugar* is the cause of the diarrhoea, and it may be very difficult to tell which article is at fault. It is, therefore, best to regard both as offenders.

If no change is made in the milk mixture and an excess of fat feeding is continued, the baby soon shows an intolerance towards it and either refuses its feed or throws it up. Later, there is persistent vomiting with diarrhoea.

Treatment.—Where baby is being fed on cow's milk, a nice balance in the diet can be easily made to meet the varying needs of fat and protein by—

- (i) feeding with whole milk ; that is without removing the cream. In such feeding, the fat and protein are about equal.
- (ii) feeding with "top" milk,* when a higher percentage of fat is wanted ;
- (iii) feeding with "skimmed milk" (in which the fat is low) when you wish to reduce the fat.

Higher fat feeding is sometimes required by the premature infant and the greatly underweight infant ; also in rickets, and when there are signs that the sugar is disagreeing with baby, the fats taking their place. It is wise to remember that you should never give an excess of fat and too much sugar in the same feed.

If a dried milk food is being used, the proportion of fat to protein may be increased or decreased, by giving a full cream preparation such as ambrosia in the one case, or by using a $\frac{3}{4}$ cream preparation of Class I (see Chap. V) in the other. A 2 : 1 dilution of a full cream milk will meet the same condition, with a teaspoonful or two of plasmon or albulactin in the day if necessary. Or a reduction in the quantity of sugar used may be all that is necessary.

III. *Carbohydrates*.—These are the most readily absorbed of all the food constituents. Their function is

* By "top milk" is meant the milk containing most of the cream or fat, by taking the top layer. To obtain it, put two pints of unboiled milk in a bottle with a fairly wide neck, and keep it in a cool place or preferably the ice chest. The cream will rise to the top, by gravity, in from four to six hours, and can be removed by pouring ; or the lower layers can be syphoned off. The lowest layers therefore will contain the least amount of fat, about 1 per cent. and are known as bottom or "skim milk."

to furnish baby with heat and energy, so that to a large extent they can be used as a substitute for fats. For instance, if fats disagree with baby and there is much vomiting, more sugar in the diet will relieve the symptoms.

Carbohydrates are the first to leave the stomach, where there is little action on them. Digestion and absorption mostly take place in the small intestine where they have a laxative effect.

Uses : (i) *Milk-sugar*, which is present both in breast milk and cow's milk, is slowly and thoroughly absorbed. Fermentation does not occur in the stomach but is rather rapid in the intestines. It is, therefore, the best sugar to use in a gastric upset, but had better be avoided when there is intestinal fermentation from its use.

(ii) *Cane-sugar*.—This is the ordinary household sugar, and is cheap and has a sweet taste. It is more rapidly fermented than either milk-sugar or malt-sugar, and some of this goes on in the stomach as well. It should therefore not be used when there is any gastric disturbance.

(iii) *Malt-sugar* is the most rapidly absorbed of the sugars and the least easily fermented, so that it is the best sugar to use when there is any intestinal disturbance. As some fermentation takes place in the stomach, however, it had better be avoided in gastric disturbances.

Malt-sugar is never given pure, but in the form of dextri-maltose. It is unsuitable for young infants when they are well.

IV. *The Starches*.—Starch must be converted into

sugar, before it can be absorbed. This conversion is brought about in several stages by secretions in the mouth and the intestines. Because it is slowly digested and slowly absorbed, starch is invaluable where sugar disagrees. It can be used in larger quantity when it is predigested or dextrinized as in the malt foods mentioned in Chapter VI.

The Fermentative Stool in Excess of Carbohydrates.—(See also section above.) The excess is shown in the stools which become loose and acid and contain a good deal of mucus. The colour is light brown. Do not let such stools alarm you, but you will be wise to change the sugar to dextri-maltose since you cannot very well reduce the amount of carbohydrate without making baby's nutrition suffer. This matter, however, must be carefully gone into by the doctor. When the baby shows an intolerance of the sugar and there is much fermentation, a good deal of gas forms in the bowel with colic and diarrhoea, the stools being watery, acid, greenish and frothy with numerous air bubbles in the solid parts that can be easily seen under the microscope. The buttocks also become excoriated.

Treatment.—Begin by omitting the sugar and changing the diet to protein milk. If you are unable to prepare this, dilute your dried milk mixture to half and half, adding two teaspoonfuls of plasmon or albulactin for the day, in order to increase the protein; or give lactic acid milk. The stools will at once then lose their acid greenish frothy character. Resume the former feeds, very gradually altering the sugar to one

that ferments in the stomach, and is more slowly absorbed such as dextri-maltose, in accordance with the directions in the preceding paragraphs. When sugar in any form disagrees, substitute starch for it.

V. *The Salts*.—The salts are necessary for the healthy growth of the baby. The most important are calcium, phosphorus and iron. The calcium must be especially seen to if there is the slightest suspicion of rickets. The phosphorus in that case will look after itself. The lime and phosphorus present in cow's milk are, however, ample if the milk is not diluted too much.

Iron, however, is not present in sufficient quantity, and if there is any tendency to anæmia, a grain of the citrate of iron and ammonium should be given daily to infants after the sixth month; or the usual milk food can be replaced by Hémolac, which contains iron and will prevent or cure the anæmia.

CHAPTER VIII

NUTRITIONAL DISORDERS IN THE BOTTLE-FED BABY

THESE form a very important group of the diseases met with in infancy and may be looked upon as the more chronic results (at least in three of them) of the wrong feeding dealt with in Chap. VII, and of insidious origin. It cannot be too strongly impressed upon mothers and nurses, therefore, that healthy progress in a baby is always marked by a steady increase in weight, and that any failure to gain weight or other evidence of malnutrition must on no account be treated lightly, but regarded as a sign of some disorder for which the physician must be consulted. The scales must never be forgotten as the best test of baby's well-being. Until recently we were groping in the dark as to the real nature of these disorders. Two doctors, Czerny and Finklestein, first showed us by their patient and laborious researches, that in the large majority of cases the main cause is a diet in which various of the ordinary constituents are present in wrong proportions, and that the infant is actually poisoned by some of these.

Czerny showed that certain well-recognized symptoms are due to the child getting too much fat, and another group to a too exclusive starch diet, while he also showed, contrary to general opinion, that the protein

was the least likely to upset the digestion. Finklestein, by keeping careful weight charts and studying the sick infant rather than the bowel, has established four distinct types of these cases, and as his views are generally accepted to-day his classification and observations form the basis of this chapter.

The characteristics of these four types are :

(a) *Simple Failure to gain weight*—a disturbance of equilibrium. Here the weight curve, which should be a steady rise, gives place to a straight line. The infant does well for a certain time and then simply does not gain weight. The motions are usually constipated and soapy.

(b) *The State of Dyspepsia*.—The weight curve turns slowly downwards or remains stationary after a loss of three to four ounces. The children are peevish and irritable and always have some diarrhœa, but they are not very ill.

(c) *Decomposition or Marasmus*.—Here there is a slow continuous fall in the weight curve for weeks and months, so that wasting is marked, with a wrinkled skin from the loss of subcutaneous fat. There may be constipation or diarrhœa.

(d) *Intoxication*.—This is characterized by a rapid loss of weight. The infant suffers severely with bad diarrhœa and there is a marked disturbance of consciousness with more or less of a rise in the temperature. In the worst form, it is known as “cholera infantum.”

The first two types can be considered together. The term *Dystrophy* is used by American pediatricians to include both conditions.

Causes.—The commonest is the feeding of a mixture that is improper in quality or quantity : too much milk, too much fat, or an inability to deal with it ; insufficiency of water intake ; food that contains the required calories but is insufficient in carbohydrates ; a diet that is too exclusively carbohydrate as by the use of certain proprietary foods ; too much dilution ; a lack of vitamins.

Symptoms.—The little patients are not exactly ill, but are pale and flabby with pasty face. It is not surprising, therefore, that it is not often noticed that anything is amiss for some time. Sometimes they are fretful and restless and sleep badly. They are also subject to frequent colds and slight attacks of bronchitis. Nutrition does not suffer at first, but as time goes on the weight gradually falls and there is wasting, so that the skin becomes dry and shrivelled.

The stools are “ soap ” stools, that is, they are dry, white, and crumbly, and easily roll off the napkin. Otherwise, there is diarrhoea from the increase of bacteria in the small intestine which set up fermentation, because the little one's system no longer tolerates the fat or carbohydrate in the diet. Several thin, greenish, watery motions are then passed in the twenty-four hours, and these may contain mucus and curds and may be frothy and sour smelling.

Treatment.—The great thing is to get at the cause. Make a careful inquiry into the diet and work out what the infant is getting.

(i) If there has been too much feeding, give smaller feeds or prolong the intervals between the feeds.

(ii) If the fat in the diet is the ingredient at fault, dilute the cow's milk with twice the quantity of barley water and feed in small quantities at first; or give butter-milk with dextrin-maltose; or use a three-quarter cream dried milk or Mellin's food.

(iii) If too little carbohydrate is retarding nutrition and the infant suffers from constipation and the stools are of a greyish colour, add sugar up to even an ounce a day. Mellin's food is excellent in such a case.

(iv) Where too much carbohydrate or starch has been the trouble, gradually reduce this, adding more milk and protein in the form of plasmon or albulactin up to two teaspoonfuls for the day.

(v) Too much dilution or an insufficiency of food intake must be met by feeding with a concentrated mixture up to the expected weight for the age, if there is no digestive upset. Sometimes there may be no increase of weight until the caloric value for even that weight is exceeded. The concentration of the milk may be effected by adding dried milk powder to the cow's milk mixture or by feeding with a full cream dried milk with the addition of gruels and dextrin-maltose, so that the carbohydrate in the diet may even be as high as 12 per cent. Or lactic acid milk, which is whole cow's milk, may effect the desired improvement, with the addition of dextrin-maltose. Water and the vitamins in the form of Ostelin, Bemax, and orange juice must be added as required.

When diarrhoea is present, treatment will often prove

difficult and tax your ingenuity. Begin by starving the baby for six or twelve hours, giving only weak tea sweetened with a grain of saccharin in the meantime. Then resume whatever the artificial feeding has been, or change to skimmed lactic acid milk, replacing the sugar by dextri-maltose, in small quantities at first. When the diarrhoea has ceased, and there are signs of an increase in weight, you may very gradually, feed by feed, change to full strength of a dried milk. If there is no improvement in a week, Greenwald * recommends giving one ounce butter-milk feeds ten times a day, four level teaspoonfuls of Mellin's food being added to every pint, with daily increases regardless of the number or character of the stools; or an acidified milk made by adding 3 c.c. lactic acid to 500 c.c. of milk, with 5 to 7 per cent. carbohydrate added. At the Berlin Orphan Asylum, Meyer uses butter-milk until the infants are six or seven months old, thickening it with butter-flour to meet the caloric value, and claims that he has greatly reduced the mortality and the liability to other infections.

Decomposition or Marasmus.—This is a chronic state of malnutrition and is a very serious condition. There is a steady downward progress until death finally occurs. The babies are always whining and appear obviously hungry. In marasmic cases, they become very weak and seem almost incapable of movement. The temperature is always subnormal and there is always the possibility of collapse.

* *Med. Clin. N. Am.*, Vol. I, 1928.

Treatment.—Protein milk or acidified milk are the best substitutes when breast feeding is not available. The latter may be prepared by adding half a grain of citric acid to an ounce of warm milk and then adding one ounce of water. Only a small quantity should be given at first—half to one ounce as a feed ten times in the day, with Mellin's food added to 3 per cent., that is, about half an ounce to a pint.

Very gradually increase the quantity until the weight keeps rising and convalescence is well established before changing to the ordinary type of milk mixture. It is best not to use dried milk foods, especially such as have a poor content of mineral salts. Vitamins must be supplied in the form of orange juice and marmite or Bemax, which latter are rich in vitamin B—a tea-spoonful in the twenty-four hours. Fresh air is all-important.

Food Intoxication—The Summer Diarrhœa of Temperate Climates—Ileocolitis.—This is an inflammatory form of diarrhœa which occurs in the first or second year of life and is by no means uncommon in Ceylon. Infections and weakening diseases are important predisposing causes. Some cases are undoubtedly due to Flexner's dysentery bacillus.

Symptoms.—The onset is sudden with vomiting, high fever, rapid loss of weight, and a watery diarrhœa. Ten to forty greenish or yellowish motions may be passed in the twenty-four hours, sometimes containing blood-tinged mucus. Vomiting is frequent and often violent. The whole system seems to suffer and become

poisoned and the infant passes into a state of apathy and disturbed consciousness although it appears wide awake.

If food is stopped all the symptoms improve or disappear; otherwise the diarrhoea becomes worse instead of better, and the stools become colourless like rice-water. If the blood is examined an increase will be found in the number of leucocytes.

Treatment.—The great need of the system in this disease is water. Therefore, in all cases of sudden diarrhoea with fever, stop all food and give plenty of plain boiled water or weak tea, sweetened with a grain of saccharin to the pint. Even better than plain water is a salt solution of half a teaspoonful to a pint, given cold, since this helps to retain water in the tissues. The period of starvation may vary from six to twenty-four hours, according to the condition of the infant. If the salt solution is not retained when given by mouth and the skin appears dry and shrivelled, Myers * recommends giving six ounces of a normal saline solution, made up with distilled water, intravenously into the superior longitudinal sinus or intraperitoneally one inch below the umbilicus.

Feed on the same lines as for decomposition, very cautiously at first, with protein milk, butter-milk, or a skimmed lactic acid milk. In other words, keep fats off the dietary but add dextri-maltose in amounts of $\frac{1}{4}$ ounce to a pint, increasing later and very gradually to three times that quantity.

* B. M. J., Vol. I, 1924.

Begin with ten $\frac{1}{2}$ -ounce feeds given every two hours. Increase by $\frac{1}{4}$ ounce a day, even though the diarrhoea continues, till the infant takes $1\frac{1}{2}$ ounces per pound of its body weight. Keep at this quantity till there is no further loss in weight; then gradually increase the amount every three days or so, and lengthen the intervals between the feeds. Change to the usual feeding mixture very gradually as indicated above.

As regards drugs, for a child of one year a grain of tannigen may be used to check the diarrhoea or Dover's powder in $\frac{1}{8}$ -grain doses, and $\frac{1}{100}$ grain of morphia hypodermically to stop the vomiting. If restlessness and sleeplessness are marked 2 grains of chloral in a tablespoonful of water may be given by rectum.

Any infection by the dysentery bacilli must be treated by polyvalent anti-dysentery serum; one bulb may be given intramuscularly as required.

PART III

THE CARE OF THE SICK CHILD

CHAPTER I

HOW TO NURSE SICK CHILDREN

CLOSE observation combined with a cheerful disposition, patience, and tact are the essential qualities necessary for the successful nursing of a sick child. The following extracts, slightly modified, from an address to the nurses at the Great Ormond Hospital for Sick Children, by the late Dr. Charles West, the founder of that Institution, are commended to the earnest study of all mothers and nurses :

(i) *What to Observe—A Child's Language.*—The signs of disease in a child differ as much according to its age as to the nature of the illness from which it is suffering. Cries are the only language by which a baby can express its distress. To the one person, all that a baby's cries mean is that it must be ill ; another, who has cultivated the power of observation, can gather much more from these cries and judge pretty accurately whether the suffering is in the head, the chest, or the stomach. *The cries of a baby with stomach-ache are loud, and long, and passionate ;* it sheds a profusion of

tears ; now stops for a moment, and then begins again, drawing its legs up to its abdomen. As the pain passes off the limbs are outstretched again, and with many little sobs the little one drops into a quiet slumber. *If there is any inflammation of the chest, it does not cry aloud, but every few minutes, especially after drawing a deeper breath than before, or after each short hacking cough, it gives a little cry, which it checks apparently before it is half finished ; and this either because it has no breath to waste in cries, or because the effort makes the breathing more painful. If the trouble is in the head, the child will utter sharp piercing shrieks, and then between whiles a low moan or wail or perhaps no sound at all, but will lie quiet and apparently dozing, till pain wakes it up again.*

It is not, however, by the cry alone, or by any one sign of disease, that you are to judge either of its nature or its degree. These remarks have been made merely to teach you the different meaning that even a baby's cry will convey to different persons.

When a child is taken ill, there is an immediate change from its condition when in health such as soon attracts the notice of the least observant. It loses its appetite, is fretful and soon tired, and either very sleepy or very restless. Its skin is hotter than usual, and it often feels thirsty. In many instances too, it feels sick or actually vomits, while its bowels are either very loose or constipated.

If old enough to talk the child generally complains of pain somewhere or other, or admits a feeling of pain

on being questioned ; but it will by no means be certain that it has correctly described the seat of the pain, if present, for a little child often says that its head aches or its stomach aches just because it has heard other people complain, when ill, of pain in the head or stomach. In the infant, however, even this help, imperfect though it be, is lacking, for a baby can only very imperfectly describe its feelings even by signs ; but it loses its cheerful look and merry laugh ; it ceases to watch its mother's or the nurse's eye as it used to do, but instead clings to her more closely than ever, and will not be put away from her arms even for a moment ; if at length rocked to sleep in her lap, on being placed in its cot again it will wake up and cry immediately.

(ii) *Points to Notice in Different Diseases.*—Throughout the whole course of a child's illness, the signs of its disease and the effects of remedies upon it will have to be carefully observed. The things which have to be specially noticed will depend very much on the disease from which the child is suffering and the stage it has reached, for the points that in the one case are of great importance may in another scarcely need mention. Thus, for instance, if a doctor fears the onset of *inflammation of the brain*, or water on the brain, your telling him that the child had been sick once or twice, or that it had no relief from the bowels, or that it had seemed very cross and irritable, and then later had been very drowsy, would be information of great value, giving him reason to fear that the little one was much worse.

If, on the other hand, the illness is from *an attack of bowel complaint* or diarrhœa, as it is called, sickness is a very common symptom which need not alarm you, and the absence of action of the bowels will be a favourable sign; any crossness of behaviour or irritability will only be natural from stomach-ache, and its falling asleep afterwards will show that the pain must have abated and that the child is therefore better in all probability.

In the same way if there is any *inflammation of the lungs*, you will look more to how their duty is performed, bearing in mind that they serve for breathing: does the child cough, how many times does it draw its breath each minute, does it lie down flat in bed with ease, to which side does it turn when in its cot, are the things which you must chiefly notice. Or if the *disease is in its stomach*, the appetite and thirst, the presence of vomiting, the state of the bowels, the cries of pain or the actual complaint of its existence, and the degree of tenderness on pressure, are the most important evidences of the illness, and those concerning which the doctor will look to you for information.

Another symptom of disorder of the brain, namely convulsions, I need not refer to as you are not likely ever to overlook it. But it is not necessary to be too much alarmed at its occurrence, and to speak and act as if it left but very little hope of a child's recovery.

(iii) *Attention to Cleanliness*.—A subject which deserves particular notice concerns the management of the child who is suffering from diarrhœa, in whom the

skin is apt, without most scrupulous care, to become much irritated, or even actually sore. Extreme cleanliness is necessary in order to avoid this, but you may not know that soap and water are very apt to irritate the surface, and are consequently very unsuitable in these cases. The less use you make of soap, therefore, the better. Olive oil, or a little thin starch on the other hand, made very thin, will not only serve every purpose of cleanliness but also soothe the inflamed and irritated skin. If any soreness is already present, dust the parts over with a little powder containing equal parts of zinc oxide, boracic acid, and starch after drying the child as carefully as possible, and afterwards apply some zinc ointment spread on a piece of soft lincn rag.

In the case of children much exhausted by any illness, and especially by diarrhoea, great care must be taken to move or lift them out of their cot or cradle for any purpose whatsoever, as little as possible ; for in such cases, fainting or convulsions can be produced by suddenly moving a child. You must learn, therefore, to sponge and clean it, and even to shift it, by merely turning it with all possible gentleness first to one side and then to the other. It must not be lifted up even to change its night-dress ; but this should be torn up the back and then taken off and a clean one put on with as little disturbance as possible. A few stitches will serve to run it together again after it has once been put on.

(iv) *How to Arrange the Warm Bath.*—The warm bath, as applying more particularly to cases of diseases

of the lungs, is often ordered by medical men, and is often extremely useful when properly managed, but yet it is frequently made a source of needless distress and terror to little children. If the bath is prepared in the presence of the child, and he is put into the water which he sees steaming before him, he naturally becomes greatly alarmed more often than not, struggles violently, cries passionately, and by thus exerting his inflamed lungs to the utmost probably does himself ten times more harm than the bath can do him good. Very different would it be if the bath is got ready out of the child's sight; if when brought to his bedside it is covered with a blanket so as to hide the steam; if he is placed upon the blanket, and gently let down into the water, and this even without undressing him if he were very fearful. And finally, if you wish to make a baby quite happy in the water, put in a couple of corks or bungs with feathers stuck in them for baby to play with. Managed thus, the much-dreaded bath often becomes a real delight to the little one, and if tears are shed at all, it is at being taken out of the water, not at being placed in it.

(v) *How to give Medicines.*—Too often indeed, medicines cannot be administered to a child without disturbing its quiet, but much of the distress which is thus occasioned may generally be avoided by a little care and management. Powerful medicines, such as will be needed by a child when very ill, can be given in the form of powders; and a small powder can be mixed with a little bread and milk in such a manner

as to be scarcely tasted. A little bread and milk may be put in a teaspoon, and then on that the powder. This, without being stirred up with the contents of the spoon, should then be covered over with a little more and may thus be swallowed almost unawares. A dose of castor oil, usually one of the great griefs of the nursery, may often be given without the least difficulty if previously mixed up in a wineglassful of hot milk sweetened and flavoured with a stick of cinnamon boiled in it, by which all taste of the oil is effectively concealed. Even really nauseous medicines too will often be swallowed by a child almost unnoticed if given when it is half asleep. This experiment, however, though very successful once or twice, will not bear frequent repetition. If after persevering trials, however, you cannot succeed in administering what has been prescribed, without fighting and struggling with the little one, it is better to desist from the attempt till the doctor's next visit, rather than to throw a child who is seriously ill into a state of furious excitement by fruitless endeavours to administer remedies, particularly if it is suffering from some disease of the brain.

The Diet of the Sick Child.—It has been already stated that when the breast-fed baby is so seriously ill that it is unable to take the breast, the milk should be expressed by hand and given in small quantities. Weaning should on no account be permitted. In the case of other children the great principle should be not to overload the stomach. Food should be given in small quantities and frequently. When the stomach is

irritable and sickness is present, it is well to make no attempt to give any kind of food or drink for a couple of hours. After the stomach has thus had complete rest for a time, a very small quantity—it may be even only a teaspoonful—of cold water may be given, and if retained, may be succeeded in a quarter of an hour by a second or third. If the water is well-borne, very small quantities of barley water or chicken broth, or any other food ordered may be given, but cold. The two chief points to be remembered are the giving of *small* quantities and the giving them *cold*. Sick children are prone to show signs of what is known as acid intoxication when they have fever. This is because the fat in the diet is not properly burned up to produce energy, and is shown by drowsiness and the appearance of acetone in the urine. Therefore in all febrile illnesses, remember not to give too much milk which contains a large quantity of fat. Half a pint a day will be sufficient with beef-tea, chicken broth, and arrowroot, as well as fruit juice. Bicarbonate of soda may be added to these.

The proper giving of nourishment to an infant in certain cases of *diarrhœa* will greatly tax your patience and resourcefulness, because often it almost completely loses the desire not only for food but even for drink, and passes into a state of apathy and will apparently sleep for hours if undisturbed. To wait for the baby to wake up in such cases is dangerous, for it is more likely to pass into a state of stupor or faint, which will end in death. When, therefore, you are told in such a

case to give nourishment, remember that the child's life depends upon your carrying out this order to the very letter. In these cases, too, it is especially important that you keep an account on a piece of paper of the quantity of nourishment taken each time, and the exact hours at which it is given. That the child is asleep is no excuse for allowing the proper time to pass without the giving of its nourishment, since you now know that death, not recovery, will be the end of such sleep if undisturbed.

In cases of *fever*, on the other hand, there is no indication for an increased quantity of nourishment, so that a word of warning is necessary to make you proof against the ill-advised remarks of others, when for days together a child may perhaps take nothing but a little tea or barley water, and the natural anxiety of the relatives and friends makes them think it is sinking for want of nourishment. You must bear in mind, however, that no food can be properly digested when fever runs high; that undigested food moreover, can disorder the stomach and bowels and do much harm and thus perhaps destroy all chance of recovery. In no disease, then, is the strictest obedience to the doctor's directions in point of diet of such moment as in the case of fever; and this obedience must show itself not only in punctually doing all that is prescribed, but also in abstaining from doing anything that has not been ordered.

CHAPTER II

HYGIENE AND METHODS OF THE SICK-ROOM

Ventilation.—The importance of fresh air to the sick child cannot be too strongly emphasized. Provided that care is taken to protect the cot from a draught, doors and windows should be kept open as much as possible, and even at night, whenever the air is warm and dry.

Careful ventilation is yet more important in the case of the Infectious Fevers, the poisons of which lose some of their virulence when diluted with fresh air. To secure a free circulation of fresh air in the sick-room it is best to do away with bed-curtains altogether.

Light.—The room in which a sick child is nursed must have plenty of light too, but, on the other hand, the glare of too much light will be found disturbing. All diseases accompanied by headache, or other symptoms referable to the brain, are particularly apt to be aggravated by strong light and in other cases too, restful sleep cannot be obtained thereby. If there are no blinds, the placing of a few fresh cocoanut branches outside against the windows will greatly relieve the glare and heat and produce a sort of twilight in the room which is most restful to the eyes of a patient. The child's cot must also be so placed that whether by

day or night, its face is turned away from the light and not directed towards it. A room that is altogether darkened is, however, not advisable when fever is likely to be associated with delirium, since the dark predisposes to hallucinations.

Furniture, etc.—There should be no more furniture in a sick-room than is absolutely necessary for the use of those in attendance. All tables, chairs, jugs, glasses, bottles, etc., therefore, not in actual use should be removed; a single table covered with a clean cloth should, however, be set apart for the medicines, nourishment, and the general use of the nurse and doctor.*

No dusting should be done in a sick-room, as that usually means simply displacing the dust, but all furniture as well as the bed may be wiped with a damp cloth. Strips of some light and easily removable matting are desirable in order to break the footfall of those entering and leaving the room. No hangings, however, should be allowed round the bed. Articles of woollen fabric retain infection more firmly than linen or calico and should therefore never be used in the sick-room if possible.

Soiled linen should be removed from the room as quickly as possible and all bed linen, sheets, etc., should be changed or aired daily. All clothing in use in infectious diseases must always be boiled or otherwise disinfected before being given to the dhoby. Bed-pans

* Since many medicines stain silver spoons, a bowl of clean water should always be kept near the medicine bottles and the spoon placed in it after use.

and urinals must be taken out of the room directly after use, and a little deodorizing fluid put into them every time. All cleansing operations, so far as practicable, should be carried out of the patient's sight and hearing, as these often cause much disturbance, discomfort, and sleeplessness.

Diluted Condyl's fluid or 1 : 1000 solution of biniodide of mercury, lysol solution, a teaspoonful to a pint of water, or 1 : 40 carbolic lotion, are useful disinfectants for the hands and linen.

Cleanliness.—Sick infants should be kept scrupulously clean and after being cleansed a dusting powder must be freely applied in order to prevent excoriations from irritating or acrid excretions. Johnson and Johnson's baby powder is one of the best. A powder consisting of two parts starch with one part each of zinc and boric acid will do as well.

How to Apply a Fomentation.—Fold a piece of flannel so that it may be four inches wide and place it on a long towel across a basin. Pour boiling water over the flannel and then quickly twist the two ends of the towel in opposite directions so as to wring it *as dry as possible*. Untwist the towel, shake out the flannel for a moment in the air (a procedure which will help to keep in the heat), and then apply over the part, covering with a piece of jaconette or an oil skin.

A *turpentine stupe* is simply a hot fomentation prepared as described above with the additional sprinkling of a few drops of turpentine over the flannel after it has been wrung out. In cramp of the stomach,

a hot "spirit" fomentation is very useful. In this, a saucer of heated whisky is poured on the flannel previously wrung out in boiling water. Any excess of spirit is squeezed out and the flannel applied till it is dry, when the process must be renewed. The boiled leaves of the marsh-mallow plant are very soothing in pain and inflammation; it is a common garden herb. Tamarind, or pomegranate leaves, boiled and applied warm, are very soothing to sore eyes.

The Use of Lotions.—A lotion is generally applied to reduce inflammation or relieve pain. This is brought about by the evaporation of the fluid from the lint or linen rags which have been soaked in the lotion and applied to the painful area without being wrung out. They must be kept continually moist, and so should be covered with oil silk to prevent evaporation, the lotion being poured on at intervals by gently raising the covering of oil silk.

Eau de Cologne or vinegar, mixed with cold water, make the best cooling lotions for the head; wounds and bruises require plain cold water; goulard lotion is the one of choice for inflamed parts.

It may be necessary in some cases of fever to apply a lower temperature than can be obtained by lotions, particularly to keep the head cool. Ice must then be used. A couple of waterproof bags are half filled with crushed ice, emptied of air, and then securely fastened at the neck by a cap. Each is wrapped in a large napkin; the one is placed under the child's head with the corners of the napkin pinned to the pillow-case to

prevent it from being displaced, while the other is allowed to rest lightly upon the head.

Sponging is really another form of applying a lotion; and in fever you can give great comfort to the little patient by sponging the entire surface of the body with tepid water, or warm vinegar and water, twice a day or as often as ordered.

Sponging the surface of the body promotes perspiration by opening up the pores of the skin, allays irritation, diminishes the frequency of the pulse by acting as a tonic on the heart, and soothes the nervous system.

Baths for the Sick Child.—Baths may be either simple or medicated. Those in common use are :

1. *The Cold Bath.*—Accurately defined, a cold bath means one at the temperature incidental to the time and place without any additions to the water.

2. *The Alcohol Sponge Bath* is one that is used for children when the temperature rises high. It is preferable to a cold bath or pack which may produce collapse. Equal parts of alcohol and water at 90° F. are used. The child is placed on a blanket and sponged with this limb by limb. Evaporation is set up and reduces the temperature. The head must be kept cool with cloths rung out of ice-cold water.

3. *The Tepid Bath* * 85° F. to 92° F.

4. *The Warm Bath* 92° F. to 98° F. This is sometimes used as a cooling agent to the body of a fever

* One part of vinegar is to be added to two or three of tepid water and the child must be sponged by degrees, i.e. the arms, the chest, the back and the legs are to be rapidly washed and dried in turn.

patient at a temperature of 95° F. The immersion should continue for from fifteen minutes to half an hour.

5. *The Hot Bath.*—Temp. 98° F. to 106° F. The cold water should be poured into the bath first, and the hot water added until the thermometer registers the required temperature. Attention has already been called to the importance of preparing this bath before it is brought into the sick-room (see, also, p. 121).

6. *The Mustard Bath.*—This is prepared by immersing a muslin bag containing two tablespoonfuls of mustard in a gallon of water of the temperature of the hot bath. The child should be placed in this for not longer than five minutes with the head supported and kept cool by Eau de Cologne and water, or iced compresses. It is then washed in plain warm water, carefully dried, and placed between blankets. This bath is very useful in collapse.

7. *The Alkaline Bath.*—Add a quarter of an ounce of sodium carbonate to each gallon of water.

8. *The Salt-water Bath.*—This is prepared by mixing half a pound of the ordinary kitchen salt with four gallons of tepid water. It may be used as a sponge bath every morning for general debility and chronic rheumatism.

9. *The Bran Bath.*—Two ounces of bran are added to each gallon of water. The bran must be first treated with a small quantity of boiling water and the whole added to the water in the bath.

10. *The Vapour Bath.*—Temp. from 90° F. to 140° F.

This is especially used to promote sweating in some cases of dropsy.

Blistering.—The best way to blister a child is by means of the blistering liquid or liquor epispasticus. It should be applied to the skin after washing and drying the area, with a small camel's hair brush for about a minute, and repeated in half an hour. In most cases actual blister formation is not desirable, but should it have taken place, the vesicles should be kept covered up with a layer of soft cotton-wool till the effused fluid becomes absorbed. If a large bleb forms and bursts, the tender surface is best dressed twice a day with a piece of oiled silk smeared with carbolated oil or lubafax. This is less painful than the application of an ointment on lint.

The time required for the formation of the blister varies and may take five or six hours.

On the whole, blistering is not a form of treatment that is much employed at the present day. Yet, it has its uses, especially when the sac in which the heart lies, becomes inflamed.

Poulticing is simply the application of local baths to the skin with the idea of allaying pain and inflammation, in such a way as to retain warmth and moisture. A poultice should be made large * so as to extend beyond the inflamed part, and in order that heat may be retained, it should be spread thick on a piece of linen the edges of which are turned in a little way on each

* A large poultice should not be continued over-long as it makes sodden and irritates the skin.

side to prevent any portion escaping beyond, and also to protect the child's clothes. A layer of cotton-wool, as well as of oiled silk, should cover it externally and a flannel bandage be applied.

As young children are apt to be restless, and to toss about in bed, the entire chest should be enveloped in a jacket poultice if it is the intention to apply one to that part of the body, but the nipples should not be covered over if possible. The jacket poultice should be constructed of a piece of linen sufficiently large to go quite round the chest, and tapes should be sewn to it in such a manner that they can be tied in front, and over each shoulder.

Poultices may be made of various substances—bread, rice-flour or starch, bran or linseed meal. In making a poultice, be sure to have boiling water ready and all the materials close at hand ready for use, otherwise it will be almost cold when finally made and soon become a stiff cold paste. So also, to avoid exposure of the warm moist skin, do not remove the old poultice till the new one is ready to replace it.

Poultices should always be applied as hot as they can be borne, and should be frequently changed, at least every two or three hours. Should it be desirable to spread oil on their surface, it is best to use vaseline.

The bread poultice cools more quickly, and gives less moisture to the skin than one made of linseed meal. A good way of making it is to cut stale bread into thick slices, put into a saucepan, and cover with boiling

water; allow this to simmer for a short time, then strain and prepare the poultice.

Starch poultices are entirely unirritating, and retain their heat for a considerable time. To make them, add a little cold water to the starch, and rub the two into a paste; then add sufficient boiling water to obtain the required consistency.

The *bran poultice* is useful on account of its lightness. It can be conveniently made by enclosing the bran in a flannel bag of the required size, and then pouring boiling water upon it.

Linseed-meal poultices retain heat and moisture longer than other kinds. They may, however, prove too irritating to the tender skin of an infant. Care should be taken that the meal is not old and contains no insects. To prepare a linseed poultice, pour sufficient boiling water into a heated bowl, then quickly sprinkle the meal into the water with one hand, and with the other keep constantly stirring the mixture with a knife, till sufficient meal has been added to make a thin and smooth paste. All this must be done as rapidly as possible.

The Boracic Poultice.—A piece of plain or boracic lint is folded, squeezed out in boiling water, and laid over the part. It is then covered with a larger piece of jaconette or oiled silk.

A *mustard plaster* consists of a thick paste of flour of mustard and hot water, or of equal parts of bread or flour, and mustard, mixed with hot water. The paste is spread on linen in the same way as for a poultice

but thinly, and then covered with thin muslin. Keep it applied till it smart^s well, but never longer than for half an hour. When it has been removed, sprinkle the surface of the body over with some nursery powder.

A convenient method of employing sinapism for the chest of a child may be practised when it is in a hot bath, by soaking a sponge with hot water, sprinkling it with flour of mustard, and then pressing it against the skin for five or ten minutes.

Enemata.—An cnema is a rectal injection and is given for a variety of purposes, *e.g.* to procure an evacuation of the bowels, to restrain diarrhoea, to destroy worms, etc.

The method of giving the injection is by means of a soft rubber rectal nozzle, or a soft rubber catheter, and about 2½ feet of soft rubber tubing to connect with a funnel, the latter being held from eighteen to twenty-four inches above the child. The rectal nozzle or catheter must not be passed more than two or three inches into the rectum. The fluid will distend the rectum and adjacent part of the bowel, but will cause vigorous peristaltic action in the whole intestinal tract by which the contents of the large bowel are propelled along the canal and finally expelled.

A larger quantity of fluid can, however, reach the ileo-cæcal valve at the junction of the large and small bowel by a backward wave along the canal, known as reversed peristalsis.

For an infant, four to six ounces of the injection will be quite sufficient in the former case; but if it is

desired to reach the cæcum, from eight to ten ounces or even more may be found necessary. The composition of the fluid varies according to the purpose for which the enema is given. The most usual for constipation, is composed of soap suds. The temperature at which the fluid is run in should be about that of the body.

CHAPTER III

COMMON AILMENTS, MEDICAL AND SURGICAL, AND THEIR TREATMENT

Abdomen.—*Pain in.* Abdominal pain is a very common symptom in the infant as well as the younger child. The most frequent cause is flatulence (*q.v.*); next in importance is undigested food in the bowel. In the infant “curds” are the cause of the trouble; in the younger child fruit and vegetables. Hard fæcal matter in the intestines and the irritation produced by threadworms may also set up abdominal pain. But there are besides, four conditions which must always be thought of in the presence of pain in the abdomen, since three of them constitute an acute illness which may prove fatal. These are appendicitis, pneumococcal peritonitis, and intussusception; the fourth is tuberculosis of the mesenteric glands, also known as tabes mesenterica. These will be described in their appropriate sections.

Abrasions are little areas where the outermost layers of the skin have been rubbed off by some injury such as a fall.

Treatment.—Apply a piece of lint or clean linen rag soaked in boric lotion (grs. \times to ʒi) or goulard lotion; or some boracic ointment. A very good

lotion to be applied in the same way is the preparation known as T.C.P. diluted 1 : 4 (see The Use of Lotions, p. 128). •

Never apply a piece of adhesive plaster.

Abscess.—A collection of purulent matter in the tissues of any part of the body is termed an abscess. It is really a large boil with more matter within. An abscess may be acute or chronic and may be superficial or deep-seated.

Causes.—Infection of the part by micro-organisms is the sole exciting cause; debility, local injury, stings, or bites of insects are only predisposing conditions.

Symptoms.—1. *Acute.* When an abscess is about to form, the inflamed part swells and throbs with pain; the part feels hot, is very tender to the touch, and the skin becomes red and shining. Fever and restlessness are generally present, and shivering may occur at intervals to indicate the formation of pus. As the pus or matter gathers and approaches the surface, the swelling softens at one part, and a sense of fluctuation or fluid may be felt beneath a finger placed there. These are signs that the abscess is about to burst and discharge its contents.

2. *Chronic.* The same symptoms as in the acute form, but very much less noticeable. These abscesses do not readily point but often burrow under the skin, and then remain stationary, without bursting, for a long time. Children who have been debilitated by long illness and are predisposed to tuberculosis are liable to suffer from them.

Treatment.—1. *Acute.* In the very early stages, a little liniment of belladonna smeared over the surface, and the application of boracic fomentations, will relieve pain and inflammation; but if abscess formation proceeds unchecked, apply boracic poultices every three or four hours.

As soon as fluctuation is felt, the abscess must be opened by the doctor. Continue the fomentations thereafter till the abscess empties itself.

The rest of the treatment consists in keeping the child on a low diet of milk, congees, and broths with a daily saline aperient (see Chap. VII) to keep the bowels regular, and a warm bath at night if it is feverish and restless. Further, a diaphoretic mixture given three times a day will keep the skin cool and moist.

2. *Chronic.* Here, too, an attempt may be made to disperse the abscess by the application of iodex or tincture of iodine for a few days. If this fails, hasten the formation of the abscess by fomentations. The general health of the child should be improved by means of tonics such as the syrup of the iodide and phosphate of iron, cod-liver oil, Squire's chemical food, or Easton's syrup; a change of air to the seaside will prove very beneficial.

Adenoids.—The adenoid is a soft fleshy mass which grows from the roof of the back of the nose and is formed by a hypertrophy of the lymphoid tissue normally found there. These growths may be found at all ages and are far from infrequent in infants.

Causes.—Chronic colds, damp, unhealthy surroundings, the too prolonged use of soft food, rickets, rheumatism. •

Symptoms.—1. *In Infants.* The baby stops sucking frequently in order to breathe through its mouth. It sleeps badly and cries and almost chokes when it drops into a deep sleep. Frequent sniffing may be noticed and a persistent catarrh of the nose.

2. *In Children.* The older child who is suffering from adenoids snores at night and talks in his sleep which is restless. Night terrors may be present and the little one may awake with a feeling of choking in the throat. Recurrent attacks of bronchitis with a chronic cold in the head are suggestive symptoms, and there may be earache and even partial deafness. The open mouth, narrow chest, enlarged tonsils, V-shaped palate, and general listless expression of the face make the diagnosis simple in typical cases.

Treatment.—1. *Infants.* If the baby's nutrition suffers because of the difficulty of breathing, have these growths removed by a surgeon experienced in the operation. In milder cases, the following drops instilled into the nostrils will give great relief :

Camphoræ	.	.	.	grs. i
Menthol	.	.	.	grs. i
Resorcini	.	.	.	grs. ii
Tincturæ benzoini	.	.	.	ʒi

Miftguttæ. Five drops to be instilled into the nostrils with a medicine dropper every three hours.

2. *In Older Children.* Palliative measures are

useless. The post-nasal growths must be removed and the enlarged tonsils in the throat shelled out at the same time by the surgeon. After-treatment consists in breaking up the habit of mouth breathing by proper breathing exercises. μ

Ague.—See Intermittent Fever.

Appendicitis.—This affection is by no means rare even in the first year of life, although it does not then run such a rapid course as in the older child. Always look with suspicion upon repeated attacks of sickness in a child as the appendix may be at fault.

Symptoms.—*Pain* is the earliest and most important symptom. It is felt in the pit of the stomach or at the navel, or it may be general; *vomiting* appears next; pain in the lower right side of the abdomen (iliac pain) with tenderness occurs later; fever is a late symptom. The diagnosis from other diseases which may present a similar picture can only be made by the medical man.

Appetite, loss of.—*Anorexia.* This is sometimes a very troublesome complaint to treat because the true cause is difficult to get at. Some temporary disturbance of the digestive tract from overfeeding, hurried meals, or the prolonged use of too soft a diet, is responsible for a large number of cases. The child “picks” at his food and puts it away after a few mouthfuls. He is out of sorts, fretful, and irritable. Sometimes the food may be refused from sheer “naughtiness”—a sign of its neurotic make-up. No solid food is taken but fluids are drunk readily. If forced to eat, the

meal is vomited. Be sure, however, not to overlook tuberculosis of the lymphatic glands in chest or abdomen, which may be the cause of all the trouble.

Treatment.—Any sign of tuberculosis must be treated by a change to the seaside, with cod-liver oil and malt to help maintain the nutrition.

Dietetic errors call for regularity in the giving of the food, which must be cut down to give rest to the digestive tract. Restrict all starchy food, but allow bacon fat, fruit, and eggs. Iron tonics will not improve the appetite but may do harm; a soda and gentian mixture will, however, prove very beneficial.

Asthma is a form of difficult breathing which occurs in paroxysms. It is met with more often amongst boys than amongst girls. It is a common disease in the Tropics in adult life. Of all cases, one-third of the number are said to begin in childhood and many even in infancy.

Causes.—Our ideas on the subject have undergone a great change in recent years. The modern view is that an attack is due to obstruction of the air tubes in the lungs by swelling of their internal lining or spasm of the muscular coat, and that this is brought about by a local irritation or the irritation of a "centre" in the brain that controls the size of these tubes. Fright, excitement, some abnormality in the nose or throat, or the digestive tract, or some foreign protein to which the child is "sensitive," may all give rise to an attack; and these irritating proteins may be derived from substances eaten as food, from

dust of various kinds inhaled, or from bacterial germs that are infecting some part of the body. Sometimes this sensitiveness is a constitutional peculiarity and is inherited.

Symptoms.—There is difficulty of breathing which comes on suddenly accompanied by a wheezing in the chest, dry cough, a feeling of suffocation, and a pale, anxious countenance which later becomes flushed. The attack generally begins in the early morning hours, but subsides towards daybreak with the expectoration of some frothy mucus, when the breathing becomes easier and the child falls asleep. On the following night again the attack recurs, and further, the paroxysms return at uncertain intervals.

This description applies to a typical attack of bronchial asthma, but in children the asthmatic condition may also reveal itself by simple attacks of difficulty in breathing which come on in bouts without a cough, or by recurring colds in the head, or by a pure bronchitis which attacks babies suddenly and as suddenly subsides with hardly any fever.*

Treatment.—The best way to cut short an attack † is by injecting two or three drops of adrenalin under the skin with a hypodermic syringe, but the cure of the asthmatic habit or tendency will require further careful management. All excitement and overstrain must be guarded against as well as exposure to damp

* Hutchinson, *B. M. J.*, Vol. I, 1927.

† In the absence of the doctor, an aperient dose of salts or castor oil may be given and a mustard plaster applied to the chest.

cold weather. The diet should be simple, small, and non-stimulating, but carbohydrates should be avoided rather than fats. If it has been found that the child is sensitive to any particular article of food, banish that from the dietary. The best drugs to use are potassium iodide, belladonna, stramonium, and arsenic (see Formula No. 3, Chap. VII). Administer these in a mixture for prolonged periods after meals.

In obstinate cases which have been proved to be "sensitive" to some protein, an attempt should be made by the medical man to "desensitize" the child to the offending substance.

Billious attacks, so-called.—The chief symptom that attracts attention is that the child has vomited; but the little one is obviously out of sorts, refuses his food, and appears more or less drowsy. There is generally a little fever. The tongue is coated. The bowels are constipated, or there is diarrhoea. The symptoms abate in two or three days and the child quickly recovers.

Causes.—Errors of diet, constipation, tonsillitis, infections of the kidney or appendix, derangement of the action of the liver may produce the picture.

Treatment.—This depends on the cause. Put the child to bed and omit his next meal. If the attack is at all severe it is best to call in the doctor, who must make a full investigation into the mode of feeding and a thorough examination. If not due to disease in the appendix, the medicinal treatment should commence with small doses of calomel every two

hours (see Formula No. 15, Chap. VII) until the bowels move, or if there is diarrhoea, with a few doses of grey powder, one grain every four hours.

The functions of the stomach and liver must be restored by abstention from food, but barley water may be given in small quantities at a time as well as sweetened drinks of orange juice. Later, milk and lime water, beef tea, and weak mutton soup may be allowed till recovery is complete. If these attacks occur frequently make a change in the diet by reducing the fats. At the same time have any infective focus attended to by the doctor.

Bites.—1. *Of animals* such as the dog or cat or rat. Medical aid must always be called in, and urgently too, if it is suspected that the animal is suffering from distemper or rabies. In the meantime wash the wound well with any lotion handy. Allow to bleed freely. Paint the surrounding skin with tincture of iodine. Cauterize the wound with a stick of nitrate of silver if possible. Apply hot fomentations to soothe the pain.

There is a Pasteur Institute in Colombo to which the child may be taken direct in the case of a bite from a mad dog. Rabies may be suspected when there is a change in the demeanour of a dog. The animal then becomes morose and tries to hide itself. It snaps at objects, is easily excited by noises, and becomes roused to fury by the presence of other dogs. Before it shows an inclination to bite people, it may be observed to become very affectionate towards its

master by licking him and in other ways fawning upon him. When such symptoms are noticed in the household dog, it should be muzzled and chained until the opinion of a veterinary surgeon is obtained.

2. *Bites or Stings of Insects*.—Scorpions, centipedes, wasps, bees, mosquitoes. The effect is generally slight, but sometimes the inflammation may spread and the child feel faint and sick.

Treatment.—If the sting of an insect has been left in the wound, remove it carefully with a pair of thin-bladed forceps. The inflammation can be prevented from spreading by firm pressure with some circular object such as a button-ring. As the poison is in the nature of an acid, the application of an alkaline solution such as Scrubb's ammonia or sal volatile, will give relief from the irritation; or, wash the part with 1:40 carbolic lotion or Condyl's fluid. Camphorated oil or glycerine will also lessen the irritation. Five to ten drops of sal volatile or brandy in a tablespoonful of water will revive the child. If the inflammation is severe and spreads up the limb call in the doctor. Bertwistle* has found 5 c.c. anti-streptococcic serum injected under the skin, very efficacious in dispersing this in a few hours.

3. *Of Snakes*.—See Poisoning and Other Emergencies, Chap. VIII.

Blebs.—*Pemphigus neonatorum*. This is a contagious skin disease in which an eruption of large vesicles or blisters containing a watery fluid appears on the skin

* B. M. J., Vol. II, 1928.

of new-born babies. These distended vesicles may rupture leaving a tender bare surface on which a crust forms. The disease tends to complete recovery in a few weeks.

Causes.—Some infection during or soon after birth ; puerperal fever in the mother.

Treatment.—Puncture each vesicle with a sterile needle to let out the fluid and apply a mild bismuth or mercurial ointment (see Formula No. 19, Chap. VII). Protect the parts by a gauze dressing. Whitfield * recommends prolonged immersion of the infant in a bath at the temperature of the body, to which has been added boric acid in the proportion of a quarter pound to ten gallons, and applying boracic ointment, when the eruption is extensive ; the infant must then be wrapped in cotton-wool.

Bleeding.—1. *From Arteries and Veins.* See Poisoning and Other Emergencies, Chap. VIII.

2. *From Leech Bites.* Firm pressure over a handkerchief or piece of lint folded in the form of a pad will generally suffice to arrest the bleeding. If it continues, soak a piece of lint or a pad of cotton-wool in steel drops or adrenalin and apply it to the bite with a bandage. A wisp of cotton-wool soaked in collodion is a very useful means of checking the bleeding ; or finally, pass a fine sewing needle, sterilized in a spirit flame, through the edges of the bite and then twist a piece of fine silk around the needle.

3. *From the Nose.* Firmly hold the nose between

* *Skin Diseases*, 2nd edition.

finger and thumb as the bleeding spot is usually on the front part of the septum or partition between the two nasal passages. Wring some cloths out of cold water and apply to the nape of the neck and the bridge of the nose. The injection into the nasal cavity of water as hot as can be borne is a useful remedy. The inhalation of the vapour of turpentine, or powdered alum used as a snuff, will in most cases arrest the hæmorrhage. A popular remedy is to apply cold steel to the back of the neck in the form of a large key or the flat blade of a knife. Peroxide of hydrogen will aid in arresting the bleeding if applied inside the nose on gauze or cotton-wool. On the principle of its use in the coughing up of blood, ipecac may be tried in doses of a quarter grain every quarter of an hour for a child of ten, with half that quantity for younger children. If these measures fail, a doctor must be called in.

Boils.—A boil is an acute inflammation of the skin and underlying tissue due to infection by way of a hair. It may occur singly or in crops. The areas are painful to the touch and reddish. Children are apt to suffer from them in the hot weather, and then sleep badly and are restless with feverishness. Loss of weight may occur.

Causes.—Improper feeding, debility, a high external temperature.

Treatment.—Hot fomentations to promote pus formation; but when the boils point, they should be freely incised by the doctor and the core removed.

The surrounding part must be protected by a smear of lanolin in order that it may not be infected with the pus. Fomentations, therefore, must not be continued when the boils are likely to burst. After incision use a dressing of gauze containing an antiseptic lotion (biniodide of mercury 1 : 500, or T.C.P. 1 in 8). Collosol manganese by mouth exerts a curative effect. Keep the bowels open with aperient mixture Formula No. 1. Improve the general health by Squire's chemical food or collosol iron. Any tendency to recurrence may need vaccines to raise the resistance to the infection.

Blind boils, which persist as hard lumps, may be dispersed by the tonic treatment outlined above, a rhubarb and soda mixture (see Formula No. 7), and the local application of iodex.

Bowels.—*Inflammation of.* See Peritonitis.

Passing of Blood and Mucus from. See Intussusception.

Relaxed. See Diarrhoea.

Brain.—*Acute Inflammation of.* Under this popular name, I shall discuss the various forms of meningitis in the order of their incidence.

1. *Tuberculous Meningitis.* This form is secondary to some tuberculous focus in the body and is invariably fatal.

Symptoms.—The first signs of the disease come on insidiously. A child to all appearances in the best of health begins to be fretful and lies down frequently after playing about, or refuses to play. If old enough

it complains of sudden pains in the head ; otherwise it is seen to put its hands up to the head frequently. It may complain of giddiness and there may be a little irregularity in its gait. The appetite is capricious. Vomiting sets in irregularly and with no relationship to meals. This is a very suggestive symptom. This condition may last a week or two till one day the child refuses to leave its bed.

The second stage of the illness has now begun. The child becomes drowsy but sleeps with its eyes open and starts up suddenly from its stupor at times with a shrill cry. The pains in the head become more intense, so that it moans continually, rolls the head from side to side, and tosses about. The temperature is raised but oscillates, and may be normal during the morning hours ; the abdomen is retracted and boat-shaped ; the pulse is slow and irregular ; there are spasmodic twitchings of the limbs.

The final stage is marked by complete unconsciousness with a rapid feeble pulse, dilated pupils, and frequent convulsive seizures, and death takes place in from ten days to six weeks from the outset of the symptoms.

The slow onset of the disease, the slow pulse, and the clear spinal fluid distinguish it from the other types.

Treatment.—All that can be done is to keep the little patient as quiet and comfortable as possible. The headache and convulsions are best treated by cold to the head and bromides.

2. *Posterior-basic Meningitis*.—This form is caused by a germ known as the meningococcus and chiefly attacks infants between the ages of six and twenty-four months. It is really the infantile type of the disease known as epidemic cerebro-spinal meningitis or spotted fever, which sometimes occurs in epidemics. Single cases are not infrequently seen in the Tropics. This germ finds its way to the brain through the nose.

Symptoms.—The chief symptoms are marked retraction of the head with vomiting, fever, and convulsions, and rapid loss of flesh and strength. In the early stages the disease may be very difficult to recognize, as fever, tremor of the limbs, and some bulging of the anterior fontanelle may be the only symptoms.* The course of the illness may be prolonged for months. Complete recovery is rare, as some form of paralysis or mental deficiency remains. This form of meningitis is recognized by the marked retraction of the head and even arching of the back, with changes in the blood and the spinal fluid.

Treatment.—This consists in tapping the spinal canal, removing about 15 c.c. of fluid, and injecting 10 c.c. of a special serum (polyvalent antimeningococcic serum) after each tapping, twice a day for three or four days. In some cases it will be necessary to inject this serum into the cavity of the brain known as the lateral ventricle.

Skilful nursing is an important part of the treat-

* Rolleston, *Lancet*, Vol. I, 1919.

ment. Keep the head and neck raised on a pillow, and apply the ice-bag when the temperature rises above 101°. Hot baths twice a day with cold applications to the head will soothe the restlessness and allay pain. Convulsions must be treated as detailed elsewhere. The ears must be constantly examined by the doctor to make sure that there is no fluid pressure in the middle ear. Cleanse the nostrils and post-nasal space daily by syringing with normal saline solution. The bowels must be kept acting regularly by a grain of grey powder which may be given twice a day for weeks. See to it that nutrition is maintained by careful feeding. This must be done by the stomach-tube if swallowing is difficult.

3. *Suppurative Meningitis.*—This is always secondary to other diseases such as typhoid fever, pneumonia, disease of the middle ear, and calls for no comment as the diagnosis must be made by the physician who has care of the main illness. It is a very fatal complication.

Bronchitis.—This is a very common affection in children and is due to an inflammation of the mucous lining of the air tubes.

Causes.—Chilling of the overheated body by exposure, cold winds in the early days of the monsoons, wet weather, rickets, enlarged tonsils. Delicate infants are more susceptible.

Symptoms.—There is a harsh, dry cough with fever up to 101° or 102° F., increased pulse rate, and increased frequency of breathing. Infants may be

restless and irritable and may vomit after a bout of coughing. In a more severe attack there will be difficulty of breathing and a loud wheezing sound may be heard. In a couple of days or so the cough becomes loose as the secretion in the tubes becomes free, and rales or noisy sounds can be heard almost all over the chest. In a week or so the chest clears up and the child is convalescent.

In the severe cases where the inflammation has spread into the smaller sized air tubes in the lungs there is always a danger of broncho-pneumonia, which is a much more serious disease, developing.

Treatment.—Keep the child warm in a large, airy room. Open the bowels at the outset with a teaspoonful of castor oil or the aperient powder Formula No. 15. The diet must consist of fluids only for the first few days, with plenty of water or lemonade. In a mild case all that is necessary is to give a mild fever mixture (see Formula No. 2); or the liquorice tea is a well-known household remedy in this country, *i.e.* the common country liquorice root, coriander seeds, tea, and sugar candy. A little camphor liniment applied to the chest or warm olive oil on a piece of lint, will prove very soothing.

In a severe attack a physician must be called in. A mustard plaster applied to the chest and back between the shoulders; or hot fomentations with a teaspoonful of turpentine added and kept up for about an hour will give great relief in the meantime. Little babies with bronchitis must not be carried

about or bathed in the ordinary way, but kept at rest in their cot to conserve their breathing powers. No alcohol is necessary. If coughing disturbs sleep, three drops of paregoric can be given in a little water to an infant of one year, and repeated if necessary. When there is much phlegm in the chest from excessive secretion, the medical man will prescribe a suitable mixture as in Formula No. 4. Great care is necessary during convalescence to prevent the condition from becoming chronic, to which end cod-liver oil with hypophosphites will help (see, also, Inflammation of Lungs).

Bruises.—A bruise is a discoloration of the skin with some swelling, and is caused by a blow or fall.

Treatment.—A cold evaporating lotion is the best application; or Goulard's lotion. It should be applied on a piece of lint or clean rag and allowed to evaporate with no other covering.

The tincture of arnica, diluted with an equal quantity of water and gently rubbed in, is very useful in alleviating pain.

Burns and Scalds. See Poisoning and Other Emergencies, Chap. VIII.

Chest.—*Contusion of.* This is caused by a blow or a fall. A severe contusion of the chest should always be examined by the doctor to make sure that one or more ribs have not been broken.

Treatment.—Rub in some soap liniment with a little laudanum in it and apply a broad flannel bandage round the chest. This will check the move-

ments of the muscles and give great relief from pain ; or sprinkle some liniment of belladonna on a piece of lint and place it over the part before bandaging.

Child-crowing.—*Laryngismus stridulus*. This is a nervous affection to which rickety children are especially liable ; it is more common in the teething period. An attack often comes on during crying, or when the child is angry.

Symptoms.—An infant who seems quite well is suddenly seized with a fit of inability to breathe, due to a spasm of the muscles in the larynx or organ of the voice. As the spasm ceases, the breath is drawn in with a shrill, whistling, or typical crowing sound. A mild attack is over before any treatment can be undertaken ; but if the attack is severe, the face becomes dusky, the eyes staring, and the child struggles for breath ; finally the face becomes pale and there are convulsive movements of the limbs. The condition may prove fatal.

Diagnosis from Croup.—These attacks may be distinguished from croup with which they are confused by the public, by the following points :

(i) The attack is convulsive, ceases suddenly, and does not occur again for some time.

(ii) There is no cough.

(iii) The noise in croup is of a hoarse barking character and occurs both with inspiration and expiration.

Treatment.—Apply a hot sponge to the throat and dash cold water on the face. Hold some smelling-

salts to the nostrils. The prevention of further attacks rests with the medical man, who must give his attention to the ventilation of the bedroom, as impure air is so often an exciting cause, and relieve any gastro-intestinal irritation. The naso-pharynx must be examined to see that there is no obstruction there. To prevent an attack at night five grains of bromide of potassium may be given to a child of three at bed-time.

Colds.—*The Common Head Cold and the Chest Cold.*

The characteristic signs of a common head cold are sneezing, watering of the eyes, a watery discharge from the nose, and slight feverishness. These may subside in a couple of days or last a week or longer. If not soon cured the inflammation may spread down to the throat and chest with sore throat and cough. •

Treatment.—Four drops of ammoniated tincture of quinine in a teaspoonful of water to a child under one year and given every four hours will prove very beneficial. In infants the discharge in the nose should be removed and the nasal passages cleansed by dropping a solution of resorcin in olive oil (five grains to the ounce) into the nostril, and then mopping with a piece of gauze. The inhalation of mentholized steam is a useful remedy for older children. Drop a few crystals of menthol into a jugful of very hot water and let the medicated steam be inhaled through the nose. If there is any cough or sore throat, apply a mustard poultice to the chest. Keep the bowels open with the powder Formula No. 15, and give a

few doses of a simple fever mixture, No. 2. If the watering of the eyes is troublesome a drop of 10 per cent. argyrol instilled into each will give great relief.

Cold in Chest.—See Bronchitis.

Colic.—*Bowel Cramp.* Gripping pains in the abdomen which come on intermittently. Infants scream violently, roll about, and draw up their legs with the pain. After, a variable time, flatus or a slimy stool is passed and there is relief; but the attacks may go on for hours sometimes, with lulls of a few minutes only in between. Colic may be distinguished from inflammation of the bowels (peritonitis, *e.g.* in appendicitis) in that pressure on the abdomen relieves the pain instead of aggravating it as in the latter disease.

Causes.—Flatulence or wind, constipation, and indigestion are the causes. In a breast-fed infant some error in the diet of the mother will be found responsible; in the bottle-fed baby, if fat or starch indigestion is not the cause, it may only mean that care and cleanliness have been wanting in the preparation of the food. Exposure to cold may be a cause. Severe colic in an infant may produce or be a sign of intussusception of the bowel, so that it is always advisable in such a case to summon medical aid.

Treatment depends on the cause.

A warm bath or hot fomentations to the abdomen will soothe the pain. Four to eight drops of brandy in a teaspoonful of dill-water, or a drop of sal volatile given in the same way, will afford much relief.

Always give an enema of two ounces of warm olive oil and follow it up by an injection of six ounces of warm water. A carminative mixture for a couple of days will help in restoring the intestinal tract to healthy action (see, also, Flatulence).

Constipation.—A child that passes scanty, hard, dry stools or whose bowels are not opened daily, may be said to be constipated. •

Causes.—Feebleness of the muscle of the bowel or of the abdominal wall; the many turns which the large bowel makes inside the abdomen; too much fat in the food; debility, are the more common conditions which cause it.

Symptoms.—Vomiting, headache, flatulence, griping, may all be the results of constipation.

Treatment.—1. *In the Breast-fed Baby.* Regular habits must be taught the baby from quite a young age, as mentioned in the chapter on the Hygiene of the Nursery, Part I, Chap. IV. Richness of the breast milk must be maintained by suitable dieting of the mother. After the first month of life you may be able to induce regular action of the bowels by giving baby a teaspoonful of orange juice or pineapple juice once or twice a day, the first to be given when it wakes in the morning. Also give baby plenty of cooled boiled water, especially in hot, sultry weather. Massage of the abdominal wall before “holding out” the infant may prove successful. If there are signs that the supply of milk is deficient, meet the deficiency by complementary feeding, or try

the effect of replacing a breast feed by a feed of Allenbury's food or Mellin's food mixed with pure fresh cow's milk as directed by the makers. The doctor had better decide this for you. Dinneford's Fluid Magnesia may be given when required (see, also, Part I, Chap. IV, 'The Hygiene of the Nursery).

2. *In the Bottle-fed Baby.*—Make sure that baby is having enough water to drink.

Raise the fat percentage to 3 per cent. if baby is being fed on the milk mixture recommended in this book. This should be done cautiously, as too much fat can also cause constipation. Make the stools less alkaline by a cautious increase of sugar. See that the ayah rigorously observes the daily routine as regards the bowels. One or two bottle feeds of Allenbury's food, Horlick's malted milk, or Mellin's food may be given each day in place of the usual feed ; or a teaspoonful of treacle or extract of malt once a day. The addition of orange juice or prune juice to the diet may prove successful. In some cases it may be necessary to have recourse to aperients. Do not give castor oil as a routine. Fluid magnesia, or some preparation of paraffin in eggspoonful doses twice a day, syrup of figs, and also syrup of senna by itself or combined with tincture of aloes and tincture of hyoscyamus, are the best preparations for routine use and may be continued for some time. If to these are added, regularity, fresh air, exercise, and massage, the condition will be rectified in time.

Convulsions, Infantile.—According to figures furnished me by the Registrar-General, more than one-fourth of all deaths under one year of life in this country are caused by convulsions. It must not be forgotten that fits of this nature are especially apt to occur during the first two years of life, even from trivial causes such as a foreign body in the nose, intestinal parasites, improper or indigestible articles of food, and teething. Rickets is an important predisposing cause. The eruptive fevers also often begin with a convulsion.

Symptoms.—An attack may come on quite suddenly without warning in an infant that is apparently well ; in other cases there is a history of a long illness with repeated fits. Slight twitching of the fingers, of the face about the eyes and mouth, and rolling of the eyes may be premonitory signs. There then follow distortion of the features and squinting with pale face and livid lips. The infant is unconscious with fixed staring eyes. Twitching of the muscles of a limb or of one-half of the body takes place, or all the limbs may be involved in slow contractions. After a time the features resume their natural appearance, the muscular twitchings cease, the breathing becomes easier, and the child passes into a deep sleep. When it awakes, it takes a normal interest in its amusements (see, also, Convulsions in Part III, Chap. I). These attacks are often confused with epilepsy, and mothers sometimes refer to child-crowing and false croup (refer to these) as fits or convulsive attacks.

Epilepsy usually occurs after the second year of life.

Child-crowing often occurs when a child has been crying and when he wakes from sleep. The peculiar whistling noise with which the breath is drawn in after a period of choking is characteristic.

False Croup.—The attack generally occurs at night. The child awakes with a sense of suffocation and has a peculiar “barking” cough. It is known to suffer from catarrh of the nose and throat.

Treatment.—The treatment of convulsions has been already considered in Part I, Chap. V, Disorders of Dentition. Always try to get at the nature of the exciting cause, and if a large meal of indigestible food has been eaten, produce vomiting by giving two grains of copper sulphate dissolved in two teaspoonfuls of water. Clear out the bowels as a routine with two grains of calomel mixed with five grains of soda. If there is flatulence give brandy as previously detailed. For some days after an attack, it is wise to keep the bowels acting freely with the powder, Formula 16.

Cough. This is such a common symptom in children that I propose here merely to draw attention to its possible significance. Treatment will depend on the various conditions indicated, and is detailed under those respective headings. The more common causes are :

- (i) Disease of the air tubes or of the lungs.
- (ii) Sore throat.
- (ii) The onset of whooping-cough.

- (iv) Teething.
- (v) Dust and smoke in the air breathed.
- (vi) Digestive disturbances.
- (vii) Worms.
- (viii) Rickets.
- (ix) Heart disease.
- (x) It may be purely of nervous origin.
- (xi) Tuberculosis of the lymphatic glands in the chest.

Croup.—This term, as used by the public, includes at least two distinct affections, namely, spasmodic laryngitis or false croup, and the true croup or diphtheria.

Spasmodic laryngitis, Laryngitis stridulosa, False Croup.—This is a condition in which there is a catarrh of the voice-box to which is added an element of spasm.

Symptoms.—A child who has had a cold and cough for a day or so suddenly wakes up at night with a cough resembling the bark of a young dog and has difficulty of breathing. The air is breathed in with a hissing sound and it seems in great distress and perspires freely, putting up the hand to the throat. The temperature is generally raised. After a couple of hours the breathing gets easier and the child drops off to sleep. The same kind of attack is repeated on the following night and, in fact, there may be more than one attack in a night (see, also, Child-crowing).

Treatment.—Boil a kettle of water quickly and allow the steam to play on the cot from the lower end. Apply a warm fomentation to the neck and give the

child some warm drink. Five drops of ipecac wine in a teaspoonful of dill-water or three drops of paregoric can be given to an infant one year old as a sedative.

Cuts and Wounds.—Such injuries are by no means uncommon in little children and can give a good deal of trouble through carelessness in dealing with them. In the first place wash the wound well with a mild lotion or even cold boiled water to remove all dirt and foreign matter. Wipe dry with a piece of clean linen and paint the edges with tincture of iodine. Then seal the wound with collodion applied on a thin layer of cotton-wool, or press the edges firmly together, dip a piece of linen in a solution of T.C.P. (1 in 4), wrap it round the part and apply a firm bandage; or, finally, it is permissible to hold the edges of the wound firmly together by strips of adhesive plaster placed across the wound.

For larger wounds with much bleeding, see Chap. VIII, Poisons and Other Emergencies.

Diarrhœa.—This is one of the commonest ailments of infants and young children in the Tropics, and should always be promptly treated by the doctor, since even a mild attack of indigestion or gastro-intestinal catarrh can become most serious and intractable in a few days, and prove fatal to the little one. Mild attacks are quite common even in the breast-fed baby, but the severer forms are nearly always met with among infants reared on artificial food. Hot weather and insanitary surroundings are especially favourable to their occurrence.

Causes.—These are very varied and each case must therefore be thoroughly investigated in order that a rational method of treatment may be adopted. The following are some of the commonest :

- (i) Unsuitable food, that is, food in which there is too much fermentable sugar or too much fat. The effect of full-cream dried milk mixtures must be carefully watched in the hot weather.
- (ii) Overfeeding in the way of too large feeds or too frequent feeds.
- (iii) Impurity in the preparation, such as the use of unboiled water, a dirty feeding bottle containing remnants of the last feed, or a contaminated milk supply ; or the sucking of dirty “soothers.”
- (iv) Exposure to cold night air.
- (v) Infections in the intestinal tract.
- (vi) A poor tolerance of cow’s milk.
- (vii) Dysentery.
- (viii) Infectious conditions in throat or lungs, such as pneumonia and also the infectious fevers such as measles.
- (ix) Nervous causes such as teething.

Symptoms.—In the mildest forms about half a dozen greenish slimy stools are passed in the twenty-four hours. These often resemble chopped spinach. Curds may also be found in them. The infant is fretful, sleeps badly, and refuses its food.

The severer forms occur quite suddenly with the

passage of foul-smelling, green stools containing a good deal of mucus which is often tinged with blood. This condition is due to some infection and may pass on to a true intoxication in which the stools become more watery and green, resembling the summer diarrhoea of the hot summer weather in Europe. Recent researches have shown that some of these cases are true dysentery due to Flexner's bacillus (see also, Intoxication, Part II, Chap. VIII).

Treatment.—The whole subject of Dyspepsia and the Nutritional Disorders of Infancy is discussed in two separate chapters in Part II. The early treatment of sudden diarrhoea will alone be considered here. When diarrhoea with, perhaps, vomiting attacks a young child, always stop all milk, but give plain water or albumen water until the arrival of the doctor. Half a teaspoonful to a teaspoonful of castor oil may, however, be given to an infant under one year to cleanse away any irritating matter in the bowel. In many cases, if given at the outset, this will cure the attack. In the more severe forms, it is best to stop all milk for a few days and give weak chicken broth or albumen water in small quantities, say half an ounce every two hours. In some of these cases cold, weak tea, as recommended by Lowenberg (made by adding a teaspoonful of tea leaves to half a pint of boiling water and infusing for one minute), has an effect that is truly miraculous. Replace the fluid lost by normal saline (one drachm to a pint) or 2 per cent. glucose solution introduced subcutaneously, and

small doses of brandy. Washing out the colon once a day with normal saline is very beneficial. Dover's powder in one-eighth grain doses for a child of one year checks the bowel movements and soothes the nervous system. A return to cow's milk feeding must be very tentative and attempted only when the stools have begun to resume the normal type, with Mellin's food and boiled milk minus the fat or cream, butter-milk, Horlick's malted milk, or skimmed acidified milk. It is well to remark here that goat's milk must not be used in these cases, since there is a crude idea among the public that it possesses some special value in infant feeding.

Diarrhœa, Chronic.—Chronic diarrhœa in an infant is found in association with simple atrophy or marasmus, which may be the result of a simple gastro-intestinal catarrh that has not been properly treated at the outset. It is described under that heading.

In the older child, it is either a form of chronic intestinal indigestion (*q.v.*) or a manifestation of a chronic inability to digest fat—coeliac disease. This is a rare disease in which fatty stools are passed, like porridge. Chronic diarrhœa may also result from anchylostomiasis.

Diphtheria or True Croup.—This is an infective disease and is due to a bacillus or germ. Children under five years of age are especially liable to contract the disease. Occasional cases occur in Ceylon. The child must be isolated for one month or six weeks.

Causes.—A special bacillus is the true cause, but

unhygienic surroundings, bad health of the child, and enlarged tonsils predispose to infection.

Symptoms.—These appear about three days after taking the infection. The initial symptoms are generally those of a common cold with running from the eyes and nose; or the child vomits, feels chilly, has a temperature, and refuses its food; the older child may complain of a headache. On the following day a yellow-white patch is seen on the tonsils which spreads, so that in a few days there will be difficulty of swallowing. If the membrane spreads down the wind-pipe; there is also a brassy ringing cough with hoarseness and stridor. The glands of the neck enlarge and become painful. The breath has a peculiar offensive odour which is very characteristic, and I have often diagnosed the condition from that alone.

Treatment.—Hoarseness in a child is always an indication for the summoning of medical aid. Cases of diphtheria vary very much in severity, but although much anxiety is generally felt by parents, the anti-toxin treatment has greatly reduced the mortality. The child must be put to bed at once and put on a liquid diet. In the diphtheria wards of the Metropolitan Asylums Board Hospitals I have found 12,000 to 16,000 units of serum a good initial dose in a case of moderate severity; 10,000 units can be safely given even to an infant of six months. When the medical attendant is in doubt it is a wise precaution to inject 4,000 units until the diagnosis is made.

The injection can be made subcutaneously or intramuscularly. The flank of the abdomen is a favourite site for the former route, and Rolleston recommends the muscles of the side of the thigh for the latter.

Dropsy is a general swollen appearance of the body. The œdema may be slight or well-marked. It may be localized.

Causes.—Infection with the hookworm or anchylostomiasis is one of the commonest causes in the Tropics among children who walk barefoot on infected soil; other causes are nutritional disturbances like marasmus and cœliac disease, where the œdema is only slight; an unhealthy state of the alimentary tract, due to a diet of sugar and starchy foods to the exclusion of fats and proteins; nephritis or Bright's disease, the œdema being especially noticeable in the lower eyelids, back, lower limbs, and genitals; disease of the heart, myxœdema. The last is a sign of deficient function of the thyroid gland in the neck, the symptoms being stunted growth, mental deficiency, swelling of the subcutaneous tissues of the face and extremities, and a wrinkling of the skin of the forehead into folds. Treatment is by thyroid extract.

Dysentery.—This is an acute infectious disease of the large bowel in which blood and mucus are passed in the stools. The mucus is clear and jelly-like. Or there may be greenish, slimy stools; or they may be profuse and watery and mixed with blood. Gripping and tenesmus and sometimes vomiting are present. There are two types: *bacillary*, caused by a special

micro-organism ; and *amœbic*, caused by an animal-cule or little bit of motile protoplasm.

Causes.—Infection is contracted from impure drinking water, the eating of raw vegetables, or of food contaminated by flies.

Treatment.—*Amœbic* dysentery is distinctly rare in children. If a microscopical examination of the stools reveals the amœba, hypodermic injections of emetine one-third grain for a child of six years, and one-eighth to one-sixth grain for a younger child, can be given daily or every other day to a total of seven injections.

Bacillary dysentery is the usual type of the dysentery of children in Tropical countries. Recent researches have shown that the summer diarrhœa of children, in cold countries, is sometimes due to Flexner's dysentery bacillus, and there is no doubt it must also often be the cause of infantile diarrhœa in Ceylon and the Tropics generally. The stools in infantile diarrhœa have unfortunately not been investigated in this country by bacteriological methods, for any definite pronouncement as to its frequency. Besides Flexner's bacillus, it may well be that the recently discovered Sonne bacillus is also a cause. At any rate, it has been reported from many countries as causing diarrhœa, sometimes of a severe type.

Treatment.—The best treatment for the condition is the castor-oil mixture or the saline aperient mixture (see Chap. VIII, Formula No. 1), till the stools, though relaxed, become feculent or normal in appearance. After three days, however, stop the mixture and give

a polyvalent anti-dysenteric serum subcutaneously in the flank of the abdomen or deep into the muscles of the side of the thigh—as much as the contents of a full bulb for a child of two years. Repeat daily or every other day in doses of half a bulb till convalescence is well established. As regards diet, stop all cow's milk, and give instead, albumen water, chicken broth, and Horlick's malted milk. Boiled water, toast-water, rice-congee water, and barley water may be given to relieve thirst.

Gerstley recommends feeding with equal parts of whey and gruel after a period of a twenty-four hours' starvation.

The pain and tenesmus will require a starch and laudanum injection into the rectum twice a day (starch two ounces, laudanum two drops). Rice-congee water forms a good starch enema.

Ear-ache.—Most children suffer from an attack of ear-ache at some time or other, and very frequently in children under two years of age suppuration also takes place.

Symptoms.—Restlessness and crying with a slight rise of temperature are the only symptoms in the infant, or baby may be seen to put up its hands to the head.

Treatment.—Give the child an aperient and get the chemist to make up some ear drops (carbolic acid ten grains, in two drachms of glycerine). Instil four or five drops into the ear and keep the baby lying on the unaffected side. Hot fomentations, too, relieve

the pain. Whenever it is recognized that a child is suffering from severe ear-ache, a doctor should be consulted so that he may take measures to prevent a perforation of the ear-drum.

Ear.—Discharge from. The “running ear” is a result of inflammation of the middle ear, that is, the part beyond the ear-drum, and means that the discharge has perforated it to get to the surface.

Causes. — Measles, pneumonia, adenoids, and whooping-cough are the most important causes in Tropical countries.

Treatment.—Twist a small quantity of cotton-wool so as to form a pointed cone and gently mop out the pus from the ear. Then let a few drops of hydrogen peroxide trickle into the ear and remain there for three minutes. Repeat the mopping process. Instil some ear drops composed of equal parts of hydrogen peroxide and rectified spirit, and lightly place a piece of cotton-wool at the entrance of the ear. Do this twice a day. The perforation in the drum of the ear heals generally, and the discharge dries up in about a month.

Foreign Bodies in.—Seeds, buttons, beads, and pebbles are often left in the ear by children accidentally. Never try to dig or scoop them out. The best way to remove them is by syringing. To do this successfully you must remember that the ear passage of the infant is not a straight tube, but is bent. The upper and lower walls also are collapsed and in contact with each other. To straighten out the passage, therefore, draw the lobe of the ear downwards.

Remember, also, that in the infant the drum of the ear is quite superficial and lies almost horizontally.

Wax in.—To remove wax in the ear, it must first be softened by dropping in oil or peroxide of hydrogen previously warmed. Allow this to penetrate the wax for a few minutes and then syringe out the ear with warm water or boracic lotion, which is made to flow in along the roof of the passage. Keep the nozzle of the syringe near the entrance of the ear.

Eyes, Sore.—Four different conditions are included under this popular name: the ordinary catarrhal conjunctivitis or simple ophthalmia; purulent ophthalmia; phlyctenular ophthalmia; and marginal blepharitis or sore eyelids. In all these affections a medical man should be consulted.

(i) *Catarrhal Conjunctivitis.*—This form of sore eyes is quite common. Some irritation set up by dust or a “spark” in the eye, or infection by micro-organisms are the causes.

Symptoms.—A feeling of heat, burning, and itching in the eye. The child who is old enough to talk will complain of a feeling as if there were sand in his eye. The inner lining of the eyelids is seen to be red and inflamed and the white of the eye as well. A slight mucoid discharge gathers which soon becomes mucopurulent. It appears in little beads at the inner angle of the eye and is seen as strings when the lower eyelid is drawn down. The eyelids are found glued together in the morning, and the child is unable to open them before they are washed.

Treatment.—Apply cold compresses to the eye, consisting of pieces of lint soaked in a 1 in 5000 solution of corrosive sublimate. After two or three days as the discharge lessens, gently evert the eyelids and paint the inner surface with a solution of collosol argentum (Crookes). Smear¹ the lids with boric ointment at night. If the child is seen daily eye drops of boric acid and zinc sulphate can be used—two or three drops to be instilled every four hours.

(ii) *Purulent Ophthalmia.*—This is a more virulent infection and unless promptly treated the eye will be irreparably damaged. Newly-born infants are infected by the mother.

Symptoms.—These are the same as before, but the discharge consists of pure pus.

Treatment.—Credé's method of instilling the eyes of new-born babes with a couple of drops of 2 per cent. silver nitrate solution is now practised by all obstetricians, so that the affection is now quite rare.

(iii) *Phlyctenular Ophthalmia.*—Debilitated children and those with a tendency to tuberculosis are especially liable to contract this form of conjunctivitis.

Symptoms.—One or more spots or small blisters appear close to the corneal margin or coloured portion of the eye. There is a great deal of sensitiveness to light and the child shows a great disinclination to open its eyes.

Treatment.—Dust the little blebs once a day with calomel; or apply yellow oxide of mercury ointment (grains five to ten in an ounce of vaseline). Fresh air

and good nourishing food are essential elements in treatment. Internally, give Squire's chemical food and cod-liver oil with malt extract.

(iv) *Blepharitis*.—In this affection the margins of the eyelids become red and inflamed and are covered with little yellow crusts so that the eyelashes readily drop off.

Treatment.—Remove the crusts with an alum lotion and apply Ung. hydrargyri nitratis dilutum or citrine ointment to the edges at bed-time.

Fever.—The body temperature in early life is very variable and uncertain. Slight or trivial causes may cause it to oscillate greatly or it may rise quite high at times for no apparent reason. All this is because the nervous system of a child in general and the heat-regulating centre in the brain as well are very unstable. Undue stress must, therefore, not be placed upon the temperature of a child, and a slight transitory rise to even 103° need not cause undue alarm, although an effort should be made to get at its cause. The types of fever met with in the Tropics may be described as simple febrile attacks; intermittent fever; remittent fever; and continued fever.

1. *Simple Febrile Attacks*.—These are quite common and last only a day or two. In an infant under one year, it will be noticed that the skin of the forehead and hands feels hot and dry; the pulse is quickened; the tongue is coated with a white fur; and the baby becomes restless. The child who is able to speak will complain of headache and pains in

his back. At night he may be restless, and talk in his sleep (delirium). On the following day all these symptoms will have disappeared.

Causes.—The commonest cause of these attacks in infants under two is a poisoning of the nerve centres from the bowel (intestinal toxæmia) due to improper food. They are especially common in artificially-fed babies. An excess of one or other of the normal constituents of the milk may be the fault; or it may be that it has been given foodstuffs unsuitable for its age and beyond its ability to digest. From what has already been stated, it must be remembered, however, that the child's temperature is elevated by the most trivial causes: a change of weather, mere display of emotion, the excitement of the "movies" or of a tea-party, fatigue, the cutting of a tooth, worms, constipation, are quite sufficient to put up the temperature in a nervous child, to which malnutrition and unhygienic surroundings still further contribute. The only signs of a tonsillitis or otitis media (inflammation of the ear) may also be an elevation of the temperature.

Treatment.—Keep the head cool with Eau de Cologne and water; withhold food for the day, giving only plain boiled water, and then milk gruel or barley water; give an aperient of calomel or castor oil and hasten its action by an enema of soap and water. If the fever has not subsided in a couple of days, a physician must be called in.

2. *Intermittent Fever.*—This is a form in which the

fever comes on every other day or once in every forty-eight hours. Three stages can be recognized in this type of fever : a *cold stage*, lasting from one to three hours, in which there is headache and shivering with cold extremities ; the *hot stage*, when the skin is hot and dry ; and the *sweating stage*, when the skin is bathed in perspiration and great relief is felt.

This description of malarial fever, however, applies only to *older children*. In *infants* under three years of age chills are not observed ; instead, the hands and feet feel cold, the lips and nails become blue, and the face is pale. Drowsiness and prostration are noticeable. Young babies infected by malaria often have no fever. They simply grow indifferent to nursing and become anæmic and stop gaining weight. If fever does occur, the temperature either does not come down to the normal level or comes down at irregular times, that is, is irregularly intermittent. Vomiting is generally present, and an infectious diarrhoea with blood-tinged mucus may occur. The spleen is often not found enlarged and this condition may go on for a month or so and is often put down to teething or insufficient breast milk. Attacks of bronchitis or asthma occur in those so predisposed ; in *younger children* the symptoms are irregular ; they are found to be listless for some days ; yawn and stretch and complain of feeling tired ; they like to sit still on certain days or may seek their bed for warmth, but there is no history of a true chill or of fever followed by perspiration. On examination, the spleen is

found enlarged and there are changes in the blood including the presence of the malarial parasite. A positive result is seldom found on a single examination, however.

Causes.—An infection of the blood by the malarial parasite caused by the bite of the anopheles mosquito ; the fever generally occurs daily in children above three years of age, there being a double infection with the tertian parasite. Remember that a daily rise of temperature may also be due to tuberculosis, pneumonia, and broncho-pneumonia.

Treatment of Malarial Fever.—At the outset, give an aperient powder of half a grain of calomel and one grain of bicarbonate of soda to an infant under one year. The sulphate of quinine, in half to one grain doses and flavoured with syrup of orange, should also be administered in mixture form every four to six hours to a child of the same age, and six grains to a child of five ; when the fever subsides, continue the quinine daily, at night only, for two months. Squire's chemical food or Easton's syrup during convalescence are necessary to rebuild the blood. In the cold stage when the feet and hands feel cold, cover the little patient with blankets and give warm drinks ; in the hot stage, remove the blankets and give cooling drinks.

Remittent Fever.—This type of fever may also be caused by malaria, and by broncho-pneumonia and sometimes pneumonia.

The symptoms are the same generally as in the hot

stage of intermittent fever with signs of difficulty of breathing when the lungs are affected. The temperature does not come down to the normal level, but generally in the early morning hours the fever abates by two or more degrees and then again begins to rise about 10 o'clock. This abatement of the fever is called a remission.

Treatment is conducted on the same lines if malaria is the cause of the fever. The head must be kept cool with eau de Cologne and water, and plenty of cooled boiled water or lemonade given as drinks. The alcohol sponge bath will prove very refreshing and will lower the temperature if the fever runs continuously high. During convalescence a change to the seaside will hasten recovery.

(iii) *Continued Fever*.—In Tropical countries fever that lasts over a week and runs at a continuous high level with only very small remissions is generally sure to be typhoid fever.

Fits.—See Convulsions, Part I, Chap. VI, p. 45 ; also Croup.

Flatulence.—A distension of the stomach or intestines with air or gas from the fermentation of food ; inflammatory disease in the bowel or lungs may produce the same result.

Causes.—The commonest cause in infancy in both breast-fed and bottle-fed babies is some error in the feeding : too frequent feeding ; too large feeds ; too much carbohydrate as in some artificial foods ; swallowing of air owing to feeding from a wrong kind

of feeding bottle ; too much curd from insufficient dilution of the milk.

Symptoms.—Pain in the abdomen with griping. The infant draws its legs up and screams with the pain till it finds relief by the passage of flatus.

Treatment.—Hot fomentations to the abdomen and an enema of warm water. A carminative mixture (see Formula No. 6) must be given for a few days. Four to six drops of brandy in a couple of teaspoonfuls of water often gives instant relief. If the stomach is distended with gas give a mixture of bismuth and soda (see Formula No. 5) rather than the carminative mixture. The diet must be carefully inquired into and corrected as found necessary.

Glands.—*Enlarged Cervical.* The glands in the neck are often found enlarged in young children. This is most frequently due to an infection reaching them from the throat, either the tonsils or the back of the nose. The lips, the skin of the face, and the head are other sources from which the infection takes place.

Causes.—The commonest causes are : a septic infection and tuberculosis. An attack of German measles is often followed by enlargement of the glands at the back of the neck.

Symptoms.—In the septic form of infection, it is not very difficult to recognize the seat of the primary disease in face and head, or tonsils and adenoids, or lips, teeth, and gums.

Infection by the tubercle bacillus occurs by way of the tonsils or the blood-stream. The stagnation of

milk in the mouth from want of cleanliness may be the starting-point. Then the germs which are the cause of the ordinary cold or influenza may settle in the little recesses of the tonsils and give rise to repeated attacks of enlargement of the glands which subside. Finally, the tubercle bacillus gains a footing and the gland in the neck close to the angle of the jaw becomes enlarged and painful. The other glands in the neck then enlarge too, with sometimes an evening rise of temperature.

Treatment.—In recurring colds with repeated attacks of enlargement of the glands, it is best to have the tonsils and adenoids removed. If the glands show no diminution in size three weeks after one of the recurring attacks, removal by operation is advised.* Do not wait till the skin over the glands becomes red, because that means their extensive breakdown.

Gums.—*Ulceration of.* This is entirely due to want of cleanliness. Food debris collects between the teeth and on the margin of the gums, so that bacteria multiply in this food medium and set up inflammation.

Symptoms.—The margin of the gums becomes red and inflamed and bleeds easily. As the process goes on unchecked, the inner surface in contact with the teeth ulcerates, the teeth may become loose in their sockets and drop out. The breath is offensive; there is generally some fever.

Treatment should be local as well as internal. Locally, a mouth wash consisting of liquor arsenicalis

* *Bower Clin. Jl.*, Vol. II, 1927.

two drachms, vini ipecac two drachms, glycerin two drachms, and peppermint water to one ounce will be found most beneficial for the older child; for young children, mix fifteen drops of this mixture with two teaspoonfuls of water and apply over the gums with a soft camel's hair brush. Internally, give potassium chlorate four grains three times a day to an infant under one year, and six grains to a child under two years.

The best preventive treatment is the use of the tooth-brush. Children must be taught to use one regularly after meals, and especially at bed-time.

Gum-boil.—The gum-boil is simply an abscess at one of the roots of a carious or diseased tooth. The best treatment is, of course, the removal of the offending tooth. Hot fomentations applied to the cheek or a hot mouth-wash of Condy's fluid will relieve the pain, but as soon as the swelling in the gum feels soft (fluctuation) it should be incised by the doctor and a mouth-wash of peroxide of hydrogen used.

Headache is a symptom which more frequently is complained of by a child of the school age, although it is not so rare even in the infant who may indicate its presence by putting its hands up to its head and crying out or beating its head, or merely by a knitting of its eyebrows.

Causes.—These are various. Constipation, dyspepsia, anæmia, a carious tooth, inflammation in the ear, nephritis, and rheumatism may all be responsible for the symptom. If accompanied by vomiting and

constipation, tuberculous meningitis is to be thought of. Recurrent attacks with fever and lasting for three days or so may be a sign of some food disorder with the absorption of poisons (toxins) from the bowel ; or it may be a true migraine.

Treatment.—Relieve any constipation, if present, by an enema of soap suds, and further secure a regular action of the bowels by a daily dose of fluid magnesia or cascara. Attend to the digestion. If the headache is accompanied by nausea, treat the dyspepsia with a few grains of bicarbonate of soda or give a carminative mixture. If indigestible food or unripe fruit has been eaten, promote vomiting with copious draughts of warm water and give the child a dose of castor oil. Keep the forehead cool with eau de Cologne and water. In *severe* cases, in addition to the above, place the feet in a warm mustard bath and apply a mustard plaster to the nape of the neck.

When a child who is suffering from a "cold" complains of pain across the forehead, give a mustard foot-bath and apply warm sponges to its forehead, or let it inhale steam medicated with half a teaspoonful of Friar's balsam and ten drops of spirits of turpentine.

Hiccough is due to flatulence and indigestion.

Treatment. See Flatulence. A mustard plaster applied to the pit of the stomach will often give relief. If this does not succeed press the thigh on the abdomen, or compress the epigastrium and put a bandage round. Pinching or slapping it, so as to make it cry, often puts an end to the hiccough.

Indigestion.—The symptoms of indigestion are pains in the abdomen, loss of appetite, a feeling of tiredness on slight exertion, a sallow complexion with dark rings round the eyes ; the bowels are constipated and the stools pale and hard. In the infant there are restlessness and irritability with vomiting and the passage of lumps of curds in the stools, or green motions with mucus. The little one is always fretful and cries much from colic or hunger (see, also, Part II, Chap. VII).

Causes.—Insufficient dilution of milk ; the giving of “ tit-bits ” from the table to infants ; unripe fruit ; too hurried meals ; too much carbohydrates.

Treatment.—An initial dose of castor oil for the bottle-fed baby and the preventing of curds by correct dilution by the addition of, sodium citrate or by peptonizing the milk may be all that will be necessary ; in the older child the management is mainly dietetic : begin with an aperient and then alter the diet. Give less bread and butter, porridge and potatoes, and stop raw fruit and tea and coffee ; correct any tendency to constipation by daily doses of Dinneford's magnesia or cascara. As regards drugs, a mixture of rhubarb and soda with a minim or two of nuxvomica will tone up the digestion. The failure on the part of the child to digest starchy food can be remedied by a teaspoonful of a malt extract given twice a day after meals.

Intussusception.—This is a form of obstruction of the bowel caused by the invagination of a portion of

intestine into the lumen or passage of the adjoining bowel. It is not uncommon in the first year of life, and especially from the fourth to the eighth month.

Causes.—Colic, diarrhoea, constipation, or strong aperient medicines may set up irregular contractions or waves in the bowel, the walls of which are thin in the infant, and so produce the invagination. Enlarged glands are often found near the junction of the small and large bowel (ileo-cæcal region) and are supposed by Thompson,* of Liverpool, to be an important cause by exercising traction on the bowel.

Symptoms.—Sudden and severe abdominal pain, at first constant and then intermittent, in a previously healthy infant, as shown by periodic attacks of crying; prostration; a localized swelling in the abdomen, which is said to be present in over one-half the cases; the passage of blood or blood and mucus from the rectum, once or several times after one or two normal stools. The child becomes abnormally quiet after a time. The temperature is not raised at first and may even be subnormal, but at the end of about twenty-four hours there is always fever which may be high.

Treatment.—In all cases of periodical attacks of crying from abdominal pain medical aid should be sought, as this disease is very fatal. When the lower bowel alone is involved, it may be possible to effect a reduction; in all other cases operative interference is necessary.

* B. M. J., Vol. I, 1924.

Jaundice is the name given to a yellow coloration of the skin and the eyes. It is a symptom of very varied significance and, although it may be of trivial import in most cases, it may also be a sign of grave disease.

Symptoms.—In the newly-born, two or three days after birth, the skin is often found yellow (*icterus neonatorum*), and the napkins are stained by the urine. This is generally of no significance and usually passes off in a fortnight. The infant appears normal otherwise and shows no disturbance. Still * is of opinion that the condition may even last two months or more and pass off leaving the infant no worse for it. Medical aid should always be summoned, however, if there are signs of drowsiness or an increase in the coloration.

Beyond the age of infancy, jaundice is generally a sign of a slight upset of the liver. After a couple of days of indisposition and loss of appetite the yellowness of the skin and eyes becomes apparent; there is more or less nausea with headache, and perhaps vomiting, and some pain in the pit of the stomach. The urine is dark and contains bile, and the stools are offensive and pale like putty. There is usually a little fever and tenderness under the ribs on the right side.

Treatment.—The jaundice of the new-born needs no other treatment than a grain of grey powder at bedtime.

The older child must be treated in bed. Begin with a dose of calomel at night and a saline aperient or magnesia on the following morning; follow this

* *Diseases of Childhood*, 4th edition.

with a mixture of rhubarb and soda with nux vomica. The aperient may be repeated every two or three days. The diet must be free from fat and starches, therefore give only skimmed milk and clear broths without fat.

Kidneys, Inflammation of, Nephritis.—This is an affection that is frequently met with in Ceylon among children from the age of four years upwards.

Causes.—We now believe that the disease is always infective, either bacteria themselves (streptococci and staphylococci in the tonsils and nasal sinuses), or poisons (toxins) elaborated by them, attacking the kidney tufts and tubules. Enlarged and infected tonsils and adenoids are found in a large number of cases.

Symptoms.—The onset is insidious and for a month or so before any definite fact causes the mother anxiety, minor signs of ill health may be noticed. The child loses his appetite, picks at his food, sleeps heavily, and shows no inclination to get up on waking in the morning. He shows no energy for play, and is generally slack. Some puffiness may be noticed under the eyes and he may occasionally vomit. Finally, advice is sought because he has passed bloody urine or appears puffy and swollen. These symptoms represent two different types of the disease. Other cases, however, may occur in the course of pneumonia or some other acute fever.

The former type with blood in the urine may recover or prove fatal in a short time; the latter tends to

become chronic. Uræmia (a poisoning of the brain centres) is heralded by an increase in the œdema, a rise in the blood pressure with vomiting, irritability, headache, unconsciousness, and convulsions.

Treatment.—Strict confinement to bed for a couple of months till cure is definite. Restrict the diet to milk with added sugar and fruit juice at first; during the second month bread and butter may be allowed, and then milk puddings, plantains, potatoes, and green vegetables; a full diet should not be resumed for about three months. Drugs are not necessary, but citrate of potash and tincture of hyoseyamus may be prescribed, and iron in the form of Parrish's food during convalescence. Do not give diuretics on any account. A turn for the better is often indicated in the first type by a sudden increase in the amount of water passed.

Lockjaw.—*Tetanus neonatorum*, or Nine-day Fits, is met with occasionally in Ceylon among newborn infants of the poorer classes, and is due to infection of the umbilicus or navel in filthy surroundings. The cause is the *tetanus bacillus*.

Symptoms.—These begin in from three to twelve days after birth, with fretfulness and disinclination to nurse. In milder cases the child may only find difficulty in sucking owing to closure of the jaws, and start every now and again with a plaintive cry and jerking of the forearms. The severe cases resemble tetanus in the adult. The head is thrown back, the back arched, and the limbs flexed, with thumbs

and great toes bent on palms and soles in almost continuous contraction. There is high fever of an irregular type. Death usually follows in these cases in a couple of days.

Treatment.—Any ulceration about the navel should be treated by the doctor. An antiseptic dressing of bichloride of mercury (1 in 5000), or carbolic lotion (1 in 60), or T.C.P. (1 part in 2 parts of warm water) is necessary. The fits should be controlled by keeping the infant under chloroform, and the use of potassium bromide four grains every three hours, and chloral hydrate one grain every hour. Tetanus antitoxin should be immediately injected into the spinal canal after Lumbar puncture, and then continued daily by the intramuscular route in the side of the thigh till the spasms are controlled.

Lungs, Inflammation of.—Pneumonia and broncho-pneumonia are considered together here, as both conditions are treated on the same lines. In infants under two years, the signs that the lung has become solid, and airless, as happens in lobar pneumonia, are often transient. In broncho-pneumonia, where such a change occurs in small patches, this distribution is often not shown by physical signs. These rather indicate that a large area or lobe has become solid because the inflamed patches have become confluent.

Symptoms.—In pneumonia the onset is sudden with fever and vomiting, abdominal pain often, and perhaps a convulsion. Broncho-pneumonia sets in gradually and often after an attack of measles or whooping-

cough, the cough becoming more troublesome with difficulty of breathing and an increase of the fever. A severe attack of bronchitis may develop into the same condition. In both diseases the child becomes prostrated and looks ill ; the respirations are increased in frequency and become laboured, and the nostrils may be seen working ; cough is feeble without any expectoration ; cyanosis or a blue coloration appears on the lips, and in more severe cases on the whole face. Pneumonia ends by a quick fall of the temperature to normal (crisis) or a more gradual fall (lysis) in about a week, in broncho-pneumonia the temperature may keep high for weeks and be markedly remittent.

Treatment.—The child must be kept in bed and plenty of fresh air allowed, with care that it is not exposed to draughts, especially in the early days of the monsoons. Give only liquid nourishment and in small quantities at a time. Keep the nose and mouth clean. A mustard plaster at the onset will give much comfort and ease the pain. As medical treatment, a mixture of citrate of potash with wine of ipecac and syrup of squills (see Formula No. 2) may be prescribed, and if there is excessive secretion tincture of belladonna may be added to the mixture, or a 1/200 grain atropine given hypodermically twice a day. Meet any tendency to drowsiness with the presence of acetone bodies in the urine by giving 5 per cent. glucose water as a drink. Constipation is treated by grey powder ; for sleeplessness give potassium bromide and chloral hydrate or syrup of chloral ; a grain of

Dover's powder or one drop of laudanum may be given to a child of three if there is great restlessness ; a high temperature is dangerous and had better be lowered by warm sponging. Signs of a failing circulation are treated by hypodermic injections of camphor in oil, a quarter to half a grain every four hours ; if collapse is marked, give a mustard bath for from two to five minutes.

Marasmus.—*Atrophy.* This is a wasting disorder which particularly affects infants under six months of age. It may occur as a primary disease, and many cases run their course without any digestive disturbances, or it may result from some fault in feeding, or from repeated attacks of dyspepsia where cane sugar is used, so that there is a failure to assimilate the food. An infant may be said to be marasmic if its weight is less than four-fifths of the expected weight for its age. Premature and weakly infants are especially prone to this form of malnutrition.

Symptoms.—Emaciation is very noticeable, the skin becoming loose and hanging in folds ; the temperature is subnormal ; there may be some vomiting ; and constipation or diarrhoea. The latter symptom is present in the more severe cases. If the condition is complicated by digestive disturbances, all the three classes of foodstuffs, carbohydrates, fats, and even proteins may be at fault. When the carbohydrates are not being digested, acid, loose, green stools are passed which may contain mucus and possibly soap curds ; if this is not checked in time diarrhoea follows

and the digestion of fats becomes impaired. Parsons is of opinion that fat indigestion must not be diagnosed merely because fat and the soap curds are found in a stool, unless the soap stool is a very bulky one *; otherwise, if there is no diarrhoea, it may be taken for granted that the fat is being well digested. Full-cream dried milk foods may also cause fat indigestion.

Treatment.—Breast feeding is the great remedy, and if even only partially available should be continued with an ordinary cow's milk mixture or protein milk as complementary feeds. The amount of food must be calculated on the basis of the expected weight for the age. If diarrhoea is present, starve the child for about twelve hours, giving only albumen water or weak tea in the meantime; a weak Mellin's food mixture, say four level tablespoonfuls to sixteen ounces of water, may then be given in half- or one-ounce feeds at first, every two hours. The digestion of carbohydrates is thus helped. Replace the water in this mixture gradually by skimmed milk two ounces at a time, that is, milk taken from the bottom of a vessel and devoid of the fat which rises to the top (gravity cream). The amount per feed and the intervals must be very gradually increased. Or protein milk † (for preparation, see Chap. IX), or acid milk may be administered in similar small feeds. If a high fat-content dried milk is being used, replace it by a three-quarter cream variety. Sometimes there


* *Lancet*, Vol. I, 1924.

† Protein milk is especially valuable for the acid green stools.

is severe vomiting. This can be relieved by the use of citrate of soda in the milk, or by adding half a grain of bicarbonate of soda to the ounce. If this fails, Parsons recommends a solution of half a grain of atropine in an ounce of distilled water, one drop of which should be given in a teaspoonful of water fifteen minutes before food, increasing to two or three drops if necessary (see, also, Decomposition, Chap. VII, Part II).

Mental Deficiency.—Mental defectiveness is by no means uncommon in children in Tropical countries. Some of these cases are absolutely incurable, but a good many may be classed as remediable if the condition is recognized early, as they result from lack of function of certain endocrine glands or from syphilis. It is to these that I wish to draw attention here, because mental deficiency can be deducible by physical signs in the first year of life. There are certain events in the infant's development and progress which occur at certain definite times, that tell of normal well-being; any great deviation from this standard must be looked upon with suspicion and a careful watch kept, even though one or two irregularities may not be of much import.

Normally, the separation of the umbilical cord is effected between the fifth and tenth days after birth, but if it has not fallen off till after the fifteenth day, or if there is any infection of the navel, you may take it for granted that one of the glands concerned with healthy development is not performing its function



and some mental defect may be expected to show itself. A normal infant weighs six or seven pounds at birth; a weight less than five pounds or more than eight pounds, if the infant is not prematurely born in the first case, points to some probable mental deficiency. The infant should be able to hold up its head by the end of the fourth month; if unable to do so by the end of the sixth month, it is a sign of some abnormality. Late cutting of the lower incisor teeth after the seventh or eighth month is not a sign of normal development. An infant is able to grasp objects at the sixth month and to recognize its nurse; but if by the end of the ninth month it is unable to hold its feeding bottle or to distinguish its nurse from strangers, some mental deficiency is sure to be present. Other signs of mental defect are a delay in walking and talking beyond the fifteenth month, the uttering of shrill cries, uncouth and unnatural gestures, rhythmical movements such as body rocking or swaying.

Thyroid gland deficiency shows itself by stunting of the growth and lack of mental development, but the most important single positive sign which distinguishes it from other forms of mental deficiency, is a delayed appearance of ossification centres in the long bones, as shown by the X-rays.

Parathyroid deficiency reveals itself in an extreme nervous irritability of the child; various muscular spasms occur, such as laryngismus stridulus, spasmodiphilia, and infantile tetany.

Deficient secretion of the *Posterior lobe of the Pituitary*

Gland is indicated when the child becomes unduly fat in the fifth or sixth year. In such cases normal growth and development after puberty does not take place.

Moles, or *nævi* are of various kinds and may often be noticed soon after birth. If they cause any disfigurement they may be removed by electrolysis, excision, the X-rays, or carbon dioxide snow.

Mouth breathing is a sign of some obstruction to the entry of free air into the nose, for which the doctor must always be consulted, because of its harmful effects. A child whose nose is blocked has great difficulty in sucking, obtains insufficient nourishment, and never expands its chest fully in breathing, so that it remains narrow and may be deformed. Decayed teeth are said to be more frequent among mouth breathers, and they are more liable to infections such as bronchitis, tonsillitis, measles, diphtheria, and other fevers.

Mouth.—*Inflammation of.* See Thrush.

Paralysis.—*Infantile.* This is an acute infectious disease of the whole of the nervous system, which is fairly frequently met with in Ceylon. It attacks children of all ages, but especially those under three years of age.

Causes.—A germ that is so minute that it can pass through the pores of a Berkfeld filter. This virus enters the brain from the mucous membrane of the nose. Children in good health may be attacked in from four to ten days after exposure to the infection.

Symptoms.—The onset is quite sudden. The child

appears restless, feels hot, may vomit, and complains of headache and pains in the back and limbs. The last is an important symptom. On examination the neck is found to be stiff and there is marked tenderness of the limbs. The temperature is raised. Drowsiness may be present. About the third day one or more limbs are found paralysed. After about six weeks, a gradual recovery of the paralysis takes place and may go on for about two years, but is generally not complete, so that a certain amount of crippling and deformity results.

Treatment.—Complete rest in bed is the first and most important necessity, and to secure this put the child in a well-padded double Thomas' frame with splints of same pattern for the limbs, with added foot-pieces. Since deformity may develop within the first few weeks, keep the knees extended and the feet at right angles. In the upper extremity, the forearm should be kept in the position of supination with elbow flexed and wrist dorsi-flexed. Urotropin five grains may be given three times a day. When the muscles are no longer tender and the acute stage has passed, massage and the galvanic electric current will help them to recover. If the condition can be diagnosed before the onset of paralysis, by the findings in the cerebro-spinal fluid (polymorphonuclear cells with normal sugar and chlorides), that may be prevented by injecting into the spinal canal serum from the blood of a convalescent patient in doses of 10 c.c. for several days.

Peritonitis.—Inflammation of the lining membrane (peritoneum) of the abdominal contents is not uncommon during the first ten years of life. Two forms are especially frequent in children :

1. *Pneumococcal Peritonitis.*—Girls between the ages of two and twelve years are more frequently attacked, the infection taking place by way of the genital tract. The inflammation is generally confined to the lower abdomen and pelvis.

Symptoms.—There is sudden abdominal pain with fever and sometimes vomiting. On examination, a diffuse tenderness is found over the lower abdomen which cannot be localized in any special area. Later there is some distension of the abdomen with rigidity of its walls. This condition is distinguished from appendicitis for which it may be mistaken, by the dusky bluish coloration of the face, and the fact that the abdomen is not so markedly rigid as in the latter affection. This form of peritonitis may also follow an attack of pneumonia, and may then be found in both sexes. The infection takes place by extension from the chest, or is conveyed by the blood-stream. The onset is sudden, with abdominal pain and a temperature of 102° or 103°.

Treatment.—In the former condition have the child nursed in the sitting position and see that absolute rest is secured. Apply an ice-bag to the abdomen and give bits of ice to be sucked in order to relieve the vomiting, and glucose by mouth or rectum. If

there is much fluid or pus, operative interference will be necessary.

2. *Tuberculous peritonitis* may be local or general and usually develops in one of two different forms—ascitic and plastic or adhesive. Children between the ages of one and six years are attacked.

(i) *The Ascitic Type*.—The onset is very gradual, the inflammation being due to the rupture of a caseating gland in the folds of the mesentery or membrane that supports the bowel in the abdomen. The abdomen slowly increases in size and the child loses weight and becomes fretful. The temperature is raised every evening. Fluid is detected in the abdominal cavity by examination, and enlarged mesenteric glands may be felt.

Treatment.—Rest, nutritious food, and fresh sea air; cod-liver oil or ostelin, and the syrup of the iodide of iron. If these general measures fail, laparotomy will often produce striking improvement.

(ii) *The Adhesive Type*.—The symptoms come on very slowly with colicky pains in the abdomen, which becomes slightly distended; the skin is dry and harsh; the bowels are constipated; there is some loss of weight; there may be nausea and vomiting. The masses of adherent omentum can be felt on examination.

Treatment.—This type should not be operated on. General measures alone are indicated.

Pyelitis is an inflammation of the lining membrane of the mouth (pelvis) of the kidney. It is

not infrequently met with among infants of the female sex and is often a cause of obscure fever in them.

Causes.—Infection by the *B. coli communis*. The route of the infection is by extension from the bowel or by way of the female genital passage from the stools discharged in the napkin.

Symptoms.—A girl baby in the first year of life is suddenly taken ill, feels hot, does not like being touched, and may vomit. The temperature is found raised and may continue intermittently for weeks with sweating and perhaps chills, if the cause is not recognized and treated. There may be frequency of micturition. The diagnosis is made by finding pus cells in the urine under the microscope.

Treatment.—Give water freely, to which fifteen grains of citrate of soda may be added, every four hours, till the urine becomes alkaline and the temperature drops; continue the citrate of soda for ten days after this. Follow up with one grain of urotropin three times a day for another week. Keep the bowels open with grey powder or calomel.

Quinsy.—*Peri-tonsillar abscess* is an abscess in the region of the tonsil. There is great swelling of the part, which also extends into the palate on one side.

Symptoms.—Great pain is complained of on one side of the throat which shoots up to the ears and downwards to the neck. The child feels ill and miserable and finds great difficulty in swallowing even fluids. There is high fever. The mouth is opened

with difficulty, and the tonsil on one side may be seen to bulge forward.

Treatment.—Keep the bowels freely open ; apply hot fomentations to the side of the neck ; give nourishment in the form of cold milk to be sucked through a tube ; as soon as fluctuation can be felt by the finger, let out the pus with a guarded scalpel. Relief is immediate ; but until healing is complete, syringe the throat frequently with a warm lotion made by dissolving a teaspoonful of bicarbonate of soda in a tumblerful of hot water.

Rheumatism.—This is a febrile disease of the joints which is not as common in the Tropics as in Europe. It may reveal itself in other ways than by attacking the joints, as in chorea (St. Vitus' Dance) and tonsillitis, growing pains, and rheumatic heart disease.

Causes.—The damp and cold weather of the monsoons ; sitting on the damp ground ; remaining in wet clothes and shoes, are the principal causes. Sore throat may be followed by an attack or may be in itself a form of the disease. A germ is believed to be the responsible agent.

Symptoms.—The affection is more common after the age of four years. Loss of appetite, sore throat, abdominal pain, and pains in the joints may be complained of. Fever is present at the same time, with furred tongue and scanty high-coloured urine. Occasionally the child may vomit and complain of headache. The pain in the joint may be quite trivial. Although, in my experience, the heart is not often

affected by a true endocarditis in Ceylon, it is a complication that must be thought of.

Treatment.—Rest in bed till convalescence is well established. As diet, give milk and barley water or soda water, and later, when the fever has subsided, bread, eggs, junket, and then fish and meat. Give as much lemonade or water as is asked for. Keep the child warmly clothed. Envelop the joints in cotton-wool kept in place by a piece of lint fixed by safety pins ; do not bandage. For severe pain in the joints mix a teaspoonful of the oil of wintergreen with an ounce of olive oil and apply on lint. Treat restlessness and sleeplessness by Dover's powder. Salicylate of soda is a specific for the disease. Give it in five-grain doses for a child under seven, and in ten-grain doses for a child above that age, but always combined with double the quantity of bicarbonate of soda, every two hours (ten doses in twenty-four hours). Increase by two to five grains every other day till evening temperature is normal, and then continue less often for another fortnight. Take care to keep the bowels well open during this treatment, and look for symptoms of poisoning by the drug such as vomiting, drowsiness, or delirium, in which case omit it for twelve hours. Apply an ice-bag over the heart if the pulse becomes unduly rapid or there are signs of endocarditis. Apply leeches before this is done, if the right side of the heart is dilated.

Rickets.—Softening of the bones is a disease due chiefly to some error in the diet that attacks infants towards

the end of the first year or in the second. It is fairly frequently met with in Ceylon, especially in its minor manifestations.

Causes.—A deficient supply or a defective absorption of animal fat, together with an excessive supply of carbohydrates in the baby's food; a lessened supply of vitamin D and of calcium and phosphorus in the diet; condensed milk and "infant foods," are the responsible factors. Unhygienic surroundings, such as dampness and the want of sunlight, increase the intensity of the disease.

Symptoms.—The most important early symptoms are head-sweating with attacks of crying and restless sleep. The child tosses about during sleep so that its bed-clothes are thrown off, and may start up screaming; beads of perspiration gather on its forehead as it lies asleep in the cot, and may even be observed when it is being fed; during the day it is cross and "jumps" if startled. There is a want of tone in the muscles so that its limbs are not moved with easy grace. Such infants are pale and particularly liable to digestive troubles, and often suffer from colds and bronchitis. The anterior fontanelle is unduly large, and does not close till about the third year. Changes in the bones develop later, but can be prevented if the nature of these symptoms is recognized early. They consist of an unduly large head in comparison with the face, a narrow chest (the pigeon-breast), "bandy" legs, and an enlargement of the extremities of the long bones.

Treatment.—Rickets can be *prevented* by fresh air and sunshine, and good fresh cow's milk in sufficient quantity, if breast milk is not available. But do not forget that rickets is possible even in the breast-fed infant, if the mother does not take proper nourishing food.

If the fat-content in the cow's milk is low, and also when dried milk is being used to feed baby, cod-liver oil and orange juice must be included in the diet as directed in Part II, Chap. I. When you begin to introduce starchy food after the sixth month, do so on the lines drawn up in the tables at the end of the chapter.

To *cure* rickets, three things are necessary :

(i) Rest, to lessen the strain on the weak muscles and correct deformities.

(ii) Phosphorated cod-liver oil ($\frac{1}{7}$ grain in 3 ounces) in teaspoonful doses three times a day.

(iii) The exposure of the body to sunshine or ultra-violet radiation in the form of the mercury-vapour quartz-lamp.

Skin.—*Affections of the.* Diseases of the skin form a common part of the affections of children in the Tropics. These can only be recognized by a professional man. In treatment, always look for the causative factor, so that you may not pass by what is after all the root of all the trouble. When prescribing, do not forget that the skin of the young child is tender and sensitive. Therefore use drugs that are soothing and unirritating, and protect the

skin from the further injury caused by scratching, which is bound to alter the nature of the affection as it first appeared, and so make diagnosis difficult.

The affections described here will be those I have myself come across, not including the eruptive fevers like measles, etc.

1. *Alopecia*.—This is a disease of the hairy scalp which produces baldness. The skin of these areas is clean and soft. Impetigo or seborrhœa may be present in the vicinity. I have found a lotion composed of lactic acid Zi , ol Ricini Zii , and spiritus vini ad Ziv , effect a rapid cure.

2. *Eczema*.—This is a common affection which may run an acute or chronic course and last for months. It may begin on the face, the head, or some other part of the body. The cause is some internal or external irritant; the latter may be some badly prepared soap or powder, or even rough and dirty clothing.

In the *acute* variety irregular red and swollen patches appear, accompanied by smarting and itching. The skin may be dry and scaling or its upper layers are raised in crops of watery pimples, which burst or are broken by scratching, leaving the surface constantly moist. The fluid may become infected by bacteria and dry up to form thin yellow crusts or scabs.

In the *chronic* variety, which may result from repeated recurrences, the skin is red and thickened and is marked by fissures or cracks with shining crusts. It is very intractable to treatment.

Treatment.—Look for the cause and remove it; inquire into the diet, rectify any evidence of malnutrition, and cut down sugar and starchy food. Prevent scratching. The victims are often constipated; this must be corrected. As regards local treatment, never allow soap and water to be used. Olive oil and linseed oil are best for cleansing purposes and to remove crusts. Calamine lotion will soothe the red, inflamed areas. It must be used as a moist dressing and covered over. Lassar's paste is the best application for the moist areas to which Gray recommends the addition of 3 per cent. crude coal tar.*

The chronic form requires stimulating ointments or lotions. These must be persevered with and their effect watched. The addition of liquor carbonis detergens to Lassar's paste in increasing proportions will produce stimulation, and after an acute reaction has been produced the milder ointment can be used.

3. *Erythema.*—*Rose Rash.* The simple form consists of small rose-red patches on the body, with a sense of tingling and itching of the skin.

Causes.—Indigestion; the use of enemata; friction with strong soaps; drinking of cold water when the body is heated; exposure to the sun.

Treatment.—Try to get at the cause. Give an aperient. Carefully inquire into the diet and draw up a simple one. Locally, a powder of one part bismuth carbonate, two parts zinc oxide, and five

* *Lancet*, Vol. I, 1926.

parts starch will prove very soothing after swabbing the part with a lotion of bran or marsh-mallow.

4. *Impetigo contagiosa*.—This is a common affection which attacks the face at the corners of the mouth and nostrils, or the folds behind the ears of children, after the first year of life.

Cause.—A surface affection of the skin by the streptococcus. It is frequently secondary to a discharge from the nose, pediculosis (lice on the head), or "itch."

Treatment.—Remove the crusts by means of starch poultices or warm olive oil and apply an ointment of 3 per cent. ammoniated mercury. Attend to the general health of the child.

5. *Miliaria*.—*Prickly heat* is quite common in Tropical countries. The eruption consists of numberless minute reddish spots of the size of a pin-head, which appear with or after much sweating. With a lens it may be seen that each spot is surmounted by a tiny bleb. There is much itching and burning. In a week's time it will subside, but keeps on appearing in fresh crops if the weather remains hot.

Treatment.—Bran baths are soothing to an infant. Calamine lotion and a powder of boric acid, camphor, zinc oxide, and starch are the best for routine use. Frequent bathing and light clothing.

6. *Napkin Dermatitis*.—This is an inflammation of the skin in the diaper area. The eruption consists of reddish spots with sometimes little blisters surmounting them, which frequently get broken on the

surface. The buttocks and thighs are affected, but the eruption may even spread down the back of the legs. You must distinguish these patches from syphilitic ones. In the latter disease the patches occur also on the palms and soles. Cooke * considers this eruption to be an ammonia dermatitis due to the soiling of the diaper by the evacuations, and the growth of a bacillus which forms ammonia from the urea of the urine. It may also be due to too much fat and protein in the diet.

Treatment.—The use of diapers impregnated with mercuric chloride (1 in 4000). The rash then disappears promptly.

Another form of napkin rash is in the nature of an *intertrigo*, which is best treated by a lotion consisting of equal parts of lime water and olive oil.

7. *Pediculosis.*—Lousiness is caused by minute insects which are easily seen with a lens. In children they infest the scalp and feed by sucking blood from it. This causes the itching and by scratching further irritation is caused and eczema may result. The eggs are enclosed in a little bag and are attached to the hair. They are known as “nits.” In neglected cases the glands in the neck may be found enlarged.

Treatment.—Cut the hair short and cover the head with rags soaked in the ordinary kerosene oil; put over this a bathing cap made of oiled silk. Repeat after twelve hours. At the end of twenty-four hours wash the head with soap and water. The nits can

* *Archiv. Dermat. and Syph.* 1926.

finally be removed with a fine tooth-comb. The great irritation of the scalp can be relieved by rubbing in ammoniated mercury ointment.

8. *Pemphigus neonatorum*.—This has already been described under Blebs.

9. *Pityriasis alba*.—This is an affection in which pink-coloured scaly patches appear on baby's face. The cause may be an infection by the streptococcus or an irritation due to constant wetting. Gray * recommends the use of an ointment composed of equal parts of 3 per cent. salicylic acid and 3 per cent. ammoniated mercury.

10. *Psoriasis*.—A disease which, though rare in the pre-school period of a child's life, may occur at all ages. Little silvery scaly patches appear first on the back of the elbows or front of the knees. The silver scales can be easily scraped off with the back of the finger-nail, showing a red area underneath, and are very characteristic. The eruption may spread and involve the whole body. It has a great tendency to recur.

Treatment.—Excepting for the face, use a 5 per cent. chrysarobin ointment applied daily. In chronic cases the intramuscular injection of autogenous serum just before the application of the ointment may be found beneficial.

11. *Ringworm*.—(i) *Of the Scalp*. A contagious disease produced by a vegetable parasite (fungus). It is rarely found in Ceylon. There is a rounded

* *Lancet*, Vol. I, 1926.

patch on the head showing broken-off hairs, or it may be partly devoid of hair. In the central part dirty scales may be seen. The diagnosis is made by pulling off a loosened and diseased hair, soaking it in a 10 per cent. caustic potash solution, and examining it for the fungus under the one-sixth inch lens of the microscope.

Treatment.—The modern treatment is twofold : (a) by the X-rays ; (b) by means of thallium acetate. The dose is reckoned at the rate of 8 mgrm. to each kilogram of body-weight. One dose by the mouth is sufficient. Careful watch must be kept for a fortnight for any toxic symptoms. The presence of albumin and casts in the urine are a contra-indication to this method of treatment.

The hairs become loosened by the end of the second week after the dose.

The advantage of thallium acetate is that it can be given even to children under three years of age for whom X-rays are not suitable.

(ii) *Of the Body.*—This is an affection caused by a similiar parasite. Reddened areas appear on the skin on which pimples form. They spread in a circular form, the edges being slightly raised and red, while the central portions become pale and scaly. They often cause intolerable itching. By scratching, a secondary infection may be produced which obscures the original disease.

Treatment.—Diluted ammoniated mercury ointment or tincture of iodine locally. Soluble mercurio-

chrome 220 in a 2 per cent. solution is highly recommended by White of America. For the dry, scaly, thickened areas Whitfield's ointment (salicylic acid grs. xv; benzoic acid ℥ss; lanolin ℥i) combined with calamine lotion is very efficacious.

12. *Scabies*.—This is a very common affection and is caused by the itch-mite, a tiny insect which burrows into the skin and produces minute blisters and pustules. Marks of scratching produced by the finger-nails are seen at the same time. The inner surfaces of the thighs and the spaces between the fingers are favourite sites.

Treatment.—Cleanliness is most important. Boil the bedding and clothing. Give the child a warm bath at night with a vigorous use of soap and then apply sulphur ointment—a drachm to an ounce of vaseline. Repeat this three nights in succession. In most cases this will cure. Do not continue the sulphur for more than three days, as it will set up irritation if used too long.

13. *Seborrhæa capitis*.—This is an affection caused by the excessive secretion of certain glands (sebaceous glands) in the skin of the head. The secretion dries and forms a dirty yellowish crust.

Treatment.—Apply warm olive oil to soften the crusts and then wash them off with soap and water. Afterwards anoint the head daily with a sulphur ointment (15 grains to an ounce of vaseline).

14. *Urticaria*.—*Nettlerash*. The eruption consists of large wheals (small areas of oedema) with pale

centres and reddened margins. They cause intense itching.

Another form (*urticaria papulosa*) occurs in the second or third year of life and consists of little red patches with a central raised surface on which may be seen a scab caused by scratching. It is very common among outpatient children in England, but I have not seen a case in Ceylon.

Causes.—Some intestinal irritant; certain fruits such as the pine-apple or strawberry; worms; a child I saw here not long ago suffered from nettle-rash whenever she ate eggs.

Treatment.—Cut down starchy food, sugar, eggs, or whatever gives rise to an attack. Treat for worms. Rough clothing should not be worn next the skin. Locally, baths containing bicarbonate of soda and a tar lotion.

Sore throat is a common ailment in children and may be due to a variety of diseases, the commonest being a mild inflammation of the back of the throat, and tonsilitis.

Causes.—Exposure to night air and damp weather; adenoids; draughts.

Symptoms.—Slight feverishness, and pain in swallowing. Vomiting may occur in infants and children may refuse their food. As they may never complain of sore throat, this should always be examined as a routine. There may only be a little redness at the back of the throat or also, when the tonsils are inflamed, little white spots will be seen on the latter

(Follicular tonsilitis), which also appear swollen and red.

Treatment.—In the mild form, give the child a warm bath and an aperient and put him to bed. Foment the sides of the neck and wrap a piece of soft flannel round it. The inhalation of mentholated steam (one grain of menthol and an eggspoonful of Friar's balsam in half a pint of hot water will prove very soothing. In tonsilitis, syringe the throat with a teaspoonful of bicarbonate of soda or listerine in a tumblerful of hot water. If the child is old enough he may be given a gargle of alum, three grains in a wineglassful of warm water, and the throat and tonsils can be painted with glycerin and tannin twice a day on a camel's hair brush or a perfectly clean piece of cotton-wool wrapped round a pencil.

Children with sore throat must not be allowed to mix with the others.

Stools.—*Blood and Mucus in.* See Dysentery; also Intussusception.

Stye is a small boil which forms on the margin of the eyelid. It is at first red and hard and then becomes yellow. A good deal of pain is present and the whole eye often swells.

Treatment.—Apply hot boracic fomentations. A slight nick with the sharp point of a scalpel may be made to let out the matter. Afterwards anoint the lid with dilute yellow oxide of mercury ointment and give Squire's chemical food internally.

Thrush.—This is a common form of sore mouth in infants caused by a vegetable parasite. The neglected and badly-fed children of the poorer classes are especially liable to the affection.

Symptoms.—The infant is restless and peevish and takes the breast or bottle with difficulty. There may be vomiting and abnormal stools, but generally there is no fever. Small white patches resembling milk curds are seen on the tip of the tongue, the cheeks, and the gums. They disappear in a few days but may persist for a long time if the child is otherwise ill, and then may promote death by causing bleeding of the gums and diarrhoea.

Treatment.—Cleanse the nipple of the mother and the child's mouth after nursing. Keep feeding bottle scrupulously clean. Do not allow the infant to have any comforters or soothers. Swab the patches two or three times a day with a saturated solution of boric acid or glycerine of borax. If there is diarrhoea give the rhubarb mixture (Formula No. 7).

Tonsils.—*Enlarged.* The tonsils are two glands situated one on either side of the back of the throat. They frequently become enlarged in children.

Causes.—The real cause is not known; decayed teeth are often present; the feeding of children with too soft food requiring no mastication is held to be responsible by some.

Symptoms.—Repeated attacks of sore throat; the speech is "thick"; snoring at night owing to obstruction to breathing. Adenoids are always present

when the tonsils are enlarged. The lymphatic glands in the side of the neck may be enlarged, causing a swelling of the neck. Infected tonsils are the cause of acute rheumatism, and even when they are not visibly enlarged, may contain a good deal of pus and be the cause of much ill-health.

Treatment.—A throat paint consisting of five grains of resorcin in an ounce of glycerin of borax will be found useful in early cases, but since there are deep winding passages (crypts) in the tonsils, it is not possible to reach the infection in this way and it is therefore best to have them removed.

Toothache in a child is due to a decayed or carious tooth. Soak a small piece of cotton wool in a couple of drops of creasote, or oil of cinnamon, or laudanum, and gently plug the tooth, taking care not to touch the cheeks or tongue in the former case. The decayed tooth should be extracted by a dentist, especially if it is one of the temporary teeth. When the gums are sore, gently rubbing them with a little table salt moistened with brandy on the finger will often give relief.

Tuberculosis.—*Abdominal.* This is the disease known as “*Tabes mesenterica*,” the mesenteric glands being affected. It is by no means rare in Ceylon. The glands become infected through little ulcers in the part of the small bowel known as the ileum, and it is the collection of glands near the lower part of it on the right side of the abdomen that are most frequently diseased.

Causes.—The drinking of the milk of cows infected with tuberculosis of the udder.

Symptoms.—The child wastes, complains of abdominal pain, and has diarrhoea. The pains are of a colicky nature and may be only a mere discomfort, or severe enough to make the child cry and double up. The loss of flesh may be marked; listlessness is always present. The diarrhoea may alternate with constipation. An irregular prolonged fever is generally present and is due to the absorption of toxins. On examination the enlarged glands can be felt; they may be fixed and not tender (see, also, Tuberculous peritonitis).

Treatment.—This must be medical. Good nourishing food and fresh air, cod-liver oil, and Squires' chemical food. Take the child to live by the sea. Ultra-violet rays may be curative.

Urine.—(i) *Absence of.* The non-appearance of urine in the newly born may be due to a defect of development, present at birth, in some part of the urinary tract, so that note should always be taken of the first passage of urine. A delay in voiding it for several hours may, however, occur from a deposit of uric acid in the kidneys and the highly acid urine may then pass in drops which dry upon the napkin. As long as there are no signs of bodily disturbance no worry need be felt on this account, but medical aid should be summoned at the end of twenty-four hours if the condition persists.

Treatment.—Always examine the bladder to make

sure that it is empty. Give pure boiled water freely and frequently. Stimulate the kidneys into action by slowly injecting into the bowel warm normal salt solution, and foment the kidneys. If the urine is scanty and acid give a couple of grains of citrate of potash in a dessertspoonful of water every three hours.

(ii) *Incontinence of.—Enuresis.* Up to the age of 2 to 2½ years the act of micturition is a reflex one, that is to say, the bladder empties itself when a certain pressure is reached within it by the urine stored there; after that time, however, the child begins to assert some voluntary power over the act; but if no control is exercised at the end of three years, the condition is a true enuresis. Bed-wetting at night and the frequent passing of water during the day is often due to a tight foreskin (*phimosis*), phosphates or stone in the bladder, epilepsy, thread-worms, or adenoids. If no cause is discoverable the condition is spoken of as essential enuresis.

Causes of Essential Enuresis.—Irritability of the bladder from excessive acidity of the urine which is due to improper feeding, and especially an excess of carbohydrates; weakness of the sphincter muscle which closes the outlet of the bladder; deep sleep; a nervous temperament; fear.

Treatment.—Treat the cause when discoverable; remove all sources of excitement and mental strain such as the cinema, strenuous games, and hard study, since such children are generally of a nervous and

excitable disposition; improve the health generally and the muscles by baths and massage; the last meal for the day must be a light one; do not give the child any tea or coffee.

Train the bladder during the day to resist emptying itself by getting the child to hold his water for longer and longer periods.* Wake him a couple of hours after he has gone to sleep and make him pass water. Prevent him from sleeping on his back, as such a position often acts as a stimulus to the centre in the spine which controls the bladder. Improve the muscular tone of the bladder by giving tincture of belladonna, seven drops three times a day—the amount of this may even be increased to twenty drops three times a day. In the case of the quiet and apathetic child, thyroid extract and strychnine are useful.

The child's confidence must always be gained and he must not be made to feel that wetting his bed is a disgrace.

Vaccination.—See Part I, Chap. IV, Hygiene of the Nursery.

Vomiting.—This is a frequent symptom in infancy and is due to various causes.

(a) There is the form known as “possetting,” in which the partially digested milk trickles from the corners of the mouth. This is a result of too vigorous sucking by the baby so that it takes in more than the stomach can contain. Overfeeding must always be remembered as a likely cause in older children too.

(b) Dyspepsia is the cause in a very large number in whom the vomiting may be even severe. Too large feeds, too frequent feeding, the use of improper infants' foods, or of milk too rich in curd or cream may upset the baby's stomach and the vomiting is to be regarded as a provision of nature to get rid of irritating products of digestion which are harmful. These cases can be recognized by an associated disturbance of the bowels: the stools are acid and irritating from excessive fermentation and produce red areas of erythema and excoriations on the skin of the infant's buttocks and thighs.

(c) Infective states of the alimentary tract, producing catarrh, inflammation, and ulceration in the large bowel, are also accompanied by vomiting and may be recognized by the character of the stools.

(d) Vomiting from nervousness or the swallowing of air—a purely functional disturbance of the normal movements of the stomach. This may also occur by sucking at an empty breast or the use of a wrong type of feeding bottle, or a teat with a blocked or small hole.

(e) Recurrent or cyclical vomiting is supposed to be due to some toxin or poison absorbed into the system.

(f) Vomiting often ushers in an acute illness.

(g) There is an important class where the vomiting may be due to a narrowing of some part of the alimentary tract from birth, or to a want of common action or co-ordination of the different parts of the muscular wall of the intestine, as in hypertrophic

stenosis of the pylorus. In the latter condition the vomiting is forcible and the infant is constipated and wastes.

In childhood vomiting is generally due to worms or indigestion from the eating of unripe fruits, etc.

Treatment.—*In the breast-fed infant*, make sure that the baby is not being nursed too frequently. Since changes in the quality of the breast milk may also produce vomiting, make sure that the supply is sufficient and of good quality (see, also, Overfeeding, Part I, Chap. II).

In the bottle-fed baby, when the stools as well are frequent and contain curds, stop all feeding at once and for twelve hours give only boiled water in small feeds sweetened with a little sugar, and with a little bicarbonate of soda added. Send for the doctor too, since the method of feeding must be carefully revised. Generally it is the fat that is at fault, and sometimes the sugar. Feeding had better, therefore, be resumed with skimmed milk, Horlick's malted milk, or skimmed lactic acid milk, and the sugar changed to dextrin-maltose in the form of Mellin's food (see, also, Diarrhoea).

When the vomiting is habitual between the feeds and no fault can be found in the feeding, thicken the milk with gruel and give smaller quantities. The vomiting due to swallowing of air and belching afterwards, can be corrected by holding the baby up after a feed, and giving one grain of choral twenty minutes before, three times in the day.

In the so-called *cyclical* vomiting of the young child, which recurs from time to time in bouts lasting a couple of days or so, stop all food and give saline subcutaneously with 2 per cent. glucose added. Any acetone odour about the breath is an indication for increasing the alkalies in the blood. In such a case give bicarbonate of soda up to 3ii in the twenty-four hours. Resume normal feeding very gradually as in the feeding in dyspepsia. Between the attacks keep the bowels acting regularly, and draw up a diet with a minimum of fat. In other respects where no cause is discoverable and the child has only vomited once or twice, put him to bed, stop food for the day, and give an aperient of calomel with bicarbonate of soda, or a dose of castor oil.

Whites.—*Vulvo-vaginitis* may occur in debilitated infants and delicate, anæmic girls. Common causes are worms, lice, foreign bodies, and the irritation produced by urine. The parts look reddened and a greenish-yellow discharge may be seen. The child often complains of pain when passing water.

Treatment.—Do not syringe. Bathe the area externally with a lotion containing a teaspoonful of bicarbonate of soda and half a teaspoonful of alum in a pint of warm water several times a day. Sea bathing is very beneficial. Fresh air, exercise, good food and tonics complete the treatment required. I have found Thyroid Extract useful in certain cases, due to hyperactivity of the glands in the cervix.

Worms.—Two types of worms are very frequent invaders of the bowel of children in the Tropics—thread-worms and round-worms.

Thread-worms.—These are thin, thread-like parasites about half an inch long, the eggs of which are supposed to be introduced into the stomach with the drinking water or raw vegetables, or by contaminated fingers. These eggs are hatched there and the worms reach their full growth and live in the appendix and large bowel. They are expelled in large numbers.

Symptoms.—There may be digestive disturbances even before the appearance of the worms in the stools. Symptoms of irritation of the nervous system are especially noticeable, such as night terrors, restlessness, teeth grinding, and bed-wetting. Pain in the abdomen is often complained of and there is generally some loss of weight with perhaps looseness of the bowels. The diagnosis is made by finding the worms in the stools; or the eggs may be recognized under the microscope.

Treatment.—Boil all drinking water and thoroughly wash all raw vegetables before they are served at a meal. Get the child to wash the hands before every meal. Keep the bowels regular by giving some Gregory's powder or prepared chalk twice a week. To relieve the irritation felt, inject into the rectum every other day about a pint of infusion of quassia diluted 1 in 30. This may be obtained ready made from the chemist. Every night smear the skin about the rectum with white precipitate ointment. Prevent

the child from putting the fingers to the part. Internally give precipitated sulphur and the compound liquorice powder, as much of each as would cover the point of a knife, three times a day. This may suitably be given in marmalade.

In a case that resists treatment try giving a santonin powder (see Formula No. 17) at bed-time, and repeat it in two days.

Round-worms.—These are on an average four to six inches long. They resemble the earth-worm. Infection is much less common than with the thread-worm. Only one may be present, or they may be found in large numbers.

Symptoms.—Picking at the nose, a depraved appetite, sleeplessness, great thirst, and signs of irritation of the nervous system. Convulsions may even occur. An obscure fever is sometimes caused by round-worms.

Treatment.—Give the santonin powder (Formula No. 17), and on three nights running, a dose of grey powder followed by a saline aperient in the morning. Carry out the same hygienic measures as for thread-worms. Children may complain of seeing objects yellow and may sometimes feel faint after santonin, and pass yellow urine.

CHAPTER IV

A SCHEME OF SUGGESTIVE SYMPTOMS AS AN AID TO DIAGNOSIS

THIS table consists of a summary of the commoner symptoms that require to be noticed in the case of a child's health, and their possible significance.

It is thus hoped that the recognition of the symptoms will teach you not to pass by too lightly such as seem trivial in themselves, without due investigation. You must in no case, however, allow a child to see that you feel anxious about any particular symptoms.

<i>Symptoms</i>	<i>Disease</i>
Abdomen, distension of.	Flatulence. Constipation. Dropsy. Inflammation or peritonitis.
„ pain in.	Colic. Constipation. Appendicitis. Tuberculosis of mesenteric glands.
Appetite, loss of	Indigestion. Debility. Nephritis.
„ depraved	Worms.

*Symptoms**Disease*

Bowels, passing of blood and mucus from.	Dysentery. Intussusception. Abdominal purpura.
Breathing, difficult or hurried.	Asthma. Pleurisy. Inflammation of lungs. Croup.
Cough and blood in expectoration.	Pneumonia. Influenza.
Cough, expectoration frothy or mucoid.	The common cold. Bronchitis. Asthma. Measles.
Countenance, purple .	Inflammation of lungs. Disease of the heart. Epileptic fits.
„ pale .	Faintness. Hæmorrhage.
Crying (see, also, Chap. I, Part III).	Indigestion and griping. Wetting of the napkin. Too strong a light. Bites of fleas or mosquitoes. Hunger or thirst.
Drowsiness and Giddi- ness.	Indigestion. Fevers. Debility. Inflammation of brain.
Ear, noises in .	Accumulation of wax in the ears. Disease of the brain.

<i>Symptoms</i>	<i>Disease</i>
Eyes, bloodshot and watery.	Catarrh. Fevers. Measles. Sore eyes.
Eyes, Squinting .	Disease of the brain. Paralysis. Convulsions.
„ yellow . . .	Jaundice.
Flatulence and Griping	Dyspepsia. Constipation. Colic.
Headache .	Dysentery. Indigestion. Disorder of the liver. Exposure to sun. Constipation. Fevers. Diseases of the ear. Disease of the brain.
Head, retraction of	Inflammation of brain. Inflammation in middle ear.
Hiccup . . .	Indigestion. Acidity.
Hoarseness . . .	Nervous cough. Croup. Sore throat. Hysteria. Inflammation of the larynx or organ of voice.

<i>Symptoms</i>	<i>Disease</i>
Limbs, pains in . . .	Influenza. Rheumatism. Fever.
„ cramps in . . .	Diarrhœa. Convulsions. Teething.
„ swelling of . . .	Nephritis. Anchylostomiasis. Heart disease.
„ twitching of . . .	Fever. Convulsions. Saint Vitus' dance.
Mouth breathing . . .	Adenoids.
Nausea and Vomiting . . .	The onset of eruptive fevers. Indigestion. Teething. Tonsillitis. Appendicitis. Obstruction in bowel.
Palpitation of the heart.	Indigestion. Nervousness. Disease of the heart.
Shivering	Malarial fever. Nervous fear.
Skin, chilliness of . . .	The common cold. Fever. Debility.
„ sweating of . . .	Hectic fever. Rheumatism.

<i>Symptoms</i>	<i>Disease</i>
Skin, sweating of (<i>contd.</i>)	Dengue fever. Malarial fever. Rickets.
Sleeplessness . . .	Indigestion. Excitement. • Fever.
Snoring . . .	Catarrh. Adenoids.
Stools, dull appearance	The soap stool.
„ greenish, acid, and frothy .	Sugar fermentation.
„ light colour, acid, dry, consti- pated . . .	Too much fat.
„ mucus in . . .	• Irritation by curds.
„ watery with mucus and possibly blood.	Severe fermentation or in- fectious diarrhoea.
Thirst . . .	Fever. Diabetes.
Throat, sore . . .	Quinsy. Relaxed throat. Tonsilitis.
„ swollen exter- nally.	Mumps. Quinsy.
Tongue, furred . . .	Disorders of the stomach. Disorders of the liver. Fevers.

<i>Symptoms</i>	<i>Disease</i>
Tongue, flabby and notched at edges . . .	Debility. . .
„ sore on . . .	Thrush. Indigestion.
Wasting	Chronic indigestion. Marasmus. Stenosis of the pylorus. Abdominal tuberculosis.

CHAPTER V

INFECTIOUS DISEASES, WITH A NOTE ON DISINFECTION

By infection is meant the spread of disease from one person to another. This is done by means of minute living organisms called germs or bacteria. These germs, then, are the cause of the disease, and symptoms are caused by their growth and multiplication in the body by thousands in a day. They leave the body in the spray of spittle when you cough, in minute scales from the skin, and in sweat and the excretions. You can easily understand, therefore, how they can be conveyed to others in the air, by the fingers, by flies, and in the clothes.

Incubation Period.—This is the interval between the taking of the infection and the first appearance of well-recognized signs of the disease. During this interval there may be some slight feeling of lack of vigour, but sometimes no signs at all that anything is wrong.

Period of Quarantine.—This is the period during which the health authorities insist that those who were in contact with the infected person when the disease first showed itself, should be segregated. It corresponds, therefore, to the period of incubation.

Period of Infectiousness.—During this period the patient can convey infection to others, and therefore he must be isolated. This period varies for the different diseases.

Chicken-pox.—*Incubation period*: 14 days. *Period of infectiousness and isolation of patient*: until all scales have fallen off. This disease is very frequent in the early hot weather. The infection is carried by the clothes or is spread from patient to patient. After slight feverishness and pains in the body for twenty-four hours, the rash appears first on the back, chest, and forehead, and then may spread over the body. It consists of little pinkish pimples which soon change to transparent blebs containing a clear fluid. By the third or fourth day these become turbid, and then dry to form scales. The eruption comes out in crops for three or four days. Fever is not very high and disappears in a couple of days. The scales drop off by the end of a week or fortnight.

Treatment.—Keep the child isolated and on a light diet for two or three days. Smear the skin with carbolic oil (1 in 50). Prevent scratching.

Small-pox.—*Incubation period*: 12 to 15 days. *Period of infectiousness*: 3 weeks; that is till all the scales have fallen off. This is a very contagious disease. The infection exists in the secretions of the body, the skin eruption, and the dried scales that come from it. It clings to everything which it comes in contact with, so that it may be conveyed by a third person.

The illness comes on suddenly with a convulsion or

chill, headache, fever, vomiting, and severe pains in the back. On the third day the characteristic eruption makes its appearance as small red spots, first on the forehead near the margin of the hair, and on the back of the wrists. Then it spreads to the rest of the face and body, especially the limbs, including the palms and soles. The spots feel hard like small shot in the skin. They become filled with fluid with a depression in the centre on the sixth day, and turn to pustules on the ninth day. These start drying by the twelfth day to form scales.

There is a mild form and a severe form (confluent small-pox) in which the lesions coalesce, so that the skin in general and the face become very swollen. This form is very fatal.

The following points distinguish small-pox from chicken-pox :

1. The distribution of the rash : centrifugal in small-pox, that is chiefly on the extremities, less on the trunk ; centripetal, or the other way about, in chicken-pox.

2. Prostration : this is marked in small-pox, so that a copious rash but no prostration is a strong argument against small-pox.

3. The depth of the spots in the skin : the best place to test this is the side of the chest.

4. The time the spots take to fully develop : if a rash becomes pustular, say, in two days, it cannot be small-pox.

Treatment.—The health authorities demand removal to the Infectious Diseases Hospital. All unvaccinated

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persons in the house must be vaccinated. Destroy or disinfect all articles and linen used by the child.

Measles.—*Incubation period*: a week to 10 days. *Period of infectiousness and isolation of patient*: the first 4 days and up to a fortnight. About ten days after exposure to the infection, the child appears to have a "cold in the head" with slight fever, redness of the eyes, and cough. If the mouth is examined at this stage, minute rose-red spots (Koplik's spots), in the centre of which are bluish-white specks, will be seen on the mucous membrane of the cheeks and are characteristic of the disease. On the fourth day the rash appears in the form of little, raised red spots about the size of a pin-head, first on the forehead and neck and then spreading to the chest, back, and arms so as to involve the whole body within thirty-six hours. Often the spots coalesce and appear to be arranged in crescents. During the next two days the eruption fades, and by the end of the week a very fine peeling of the skin begins.

Treatment.—Measles is a mild disease in Tropical countries. Confine the child to bed and keep the bowels open with fluid magnesia. Treat the bronchitis as detailed elsewhere. Bathe the eyes if inflamed with a boric acid lotion (15 grains to the ounce). Should the eruption disappear suddenly (popularly described as "going in") and the skin appear purple, give a mustard bath and call in medical aid.

German Measles.—*Rubella*. *Incubation period*: 2 to 3 weeks. *Period of infectiousness and isolation of*

patient: 5 days and 3 weeks. A mild cold or sore throat develops with slight fever and loss of appetite, and on the following day the rash appears on the face in the form of minute pink spots and spreads rapidly over the body. It is never seen at its height simultaneously all over, for it fades on the face before the lower extremities are reached. The glands in the neck are constantly enlarged in almost all cases.

Treatment.—No special treatment is required other than a light diet and rest in bed.

Influenza.—*Incubation period*: a few hours to 3 days. *Period of infectiousness*: the catarrhal stage. The onset is sudden with pains in the head and body, fever, and much prostration. Inflammation of the respiratory tract predominates in children, with all the signs of inflammation at the back of the nose and the throat, and soon the organ of the voice, the wind-pipe; and the air tubes in the lungs become involved in the process and broncho-pneumonia may develop.

Treatment.—Isolate the child in bed and put him on a liquid diet. Good ventilation and plenty of fresh air are essential requirements. Call in the doctor. Quinine salicylate is the best drug (see Formula No. 12). Give stimulants from the beginning—strychnine and brandy.

Mumps.—*Incubation period*: 12 to 26 days (Ker). *Period of infectiousness and isolation of patient*: 3 weeks.

This is a disease of the glands which secrete saliva. Children above the age of two years are most frequently affected. The infection is conveyed directly

from person to person. In the child, the onset is mild with a feeling of chilliness, drowsiness, perhaps vomiting and slight fever. In a day or two a feeling of fullness and pain below the lobe of the ear on one side of the face is complained of and the inflamed gland is felt as a swelling; in a few days the opposite gland also swells. The effort to bite food produces great pain and for that reason food may be refused. The illness lasts about a week.

Treatment.—Give an aperient and put the child to bed. Keep the mouth clean with a Listerine mouth-wash. The diet must be liquid. Apply hot fomentations to the swollen glands, or paint them with liniment of belladonna and cover with a piece of lint and soft flannel.

Whooping-cough is quite common in Ceylon. *Incubation period*: 7 to 14 days. *Period of infectiousness and isolation of patient*: 2 months. A few days to a fortnight after exposure to the infection, the child sneezes and has a slight cough, especially at night, with fever. The cough increases after a few days, and in about ten days' time the characteristic "whoop" appears, by which air is drawn into the lungs after the several expiratory efforts of coughing, to be followed by vomiting if the stomach contains any food. Several of these attacks occur during the day and prove very distressing and exhausting to the little patient. This continues for about a month before any amelioration is noticed.

Treatment.—Unlimited fresh air. Try to have the child spend most of the day on the seashore if it can be managed, apart from other children, for that is un-

doubtedly beneficial. Give a liquid diet; it is a good plan to give nourishment soon after a paroxysm; it is more likely to be retained then.

Paint the chest once a week front and back alternately with the linementum crotonis B.P. Paregoric in a mixture (see Formula No. 18) is one of the best drugs for routine use. In long standing cases the spasms can be reduced by the administration of ten drops of a 20 per cent. alcoholic solution of benzyl benzoate* in a mixture for a child of two, or by seven or eight drops of tincture of belladonna with bromides. The last few years have seen the introduction of a vaccine. The preparation marked C (P. D. & Co.) may be given to the amount of 0.2 c.c. for a child of five as an initial dose, and increased every three or four days by 0.2 c.c. till a full cubic centimetre is given. A freshly prepared vaccine, from four strains of the bacillus mixed with other organisms present, is claimed to give better results. For the chronic cases, intramuscular injections of ether after the method of Audrain are of great curative value but are very painful—1 c.c. deep into the gluteal muscles every other day for a child aged one to three years.†

Enteric Fever.—*Incubation period:* 1 to 3 weeks. *Period of infectiousness and isolation of patient:* till all secretions are normal. Enteric fever is quite common in children in the Tropics, but is milder in type than when young adults are attacked. Infection

* Bennett, *Lancet*, Vol. I, 1923.

† Il. *Policlinico*, Vol. I, 1921.

is conveyed by flies, and contaminated fingers and food. The onset in older children is with headache and chilliness, and a fever which keeps rising daily up to a maximum, but in infants there is high fever at the start which becomes remittent, with symptoms of an infection of the bowel. Cough is often present and there may be a little delirium at night. The spleen can be felt during the second week of the illness, and the typical rose-red spots may be seen on a fair skin about the end of the first week on abdomen, chest, and back. The disease lasts for about a month, the fever being of a remittent type, with a drop to the normal level every now and again. The pulse-rate may be very frequent, unlike the slow pulse of young adults.

Treatment.—This is in no way different from that in adults: complete rest in bed and a milk diet with chicken broth, barley water, plenty of plain boiled water to drink, and sweetened orange juice. If there is tympanites, stop the milk and give gruels with dextri-maltose, and albumin water. No drugs are necessary except to meet complications, but a simple fever mixture may be prescribed as a placebo. All the excreta must be thoroughly disinfected.

Common Disinfectants

By disinfection is meant the destruction of the *virus* of the disease. This must be thoroughly done as otherwise there is only a false sense of security.

It must be emphasized here that substances which merely remove the unpleasant odours attending putre-

faction, such as the burning of tar and incense, are not by any means destructive of the poison and therefore are not true disinfectants, and must never be relied upon for that purpose.

The following are true disinfectants and are those in most common use :

Carbolic acid (crude) : seven ounces to a gallon of water make a 5 per cent. solution. •

Chloride of lime : three ounces to a gallon make a 3 per cent. solution.

Corrosive sublimate : 1 : 1000 solution.

Lysol : 2 per cent. solution. . . .

Mercury biniodide : a teaspoonful to a gallon makes a 1 : 1000 solution.

CHAPTER VI

COMMON HOUSEHOLD REMEDIES AND THEIR USES

THE following list of remedies is given here as likely to prove very useful when there are children in the home. It is recommended that a stock be kept in the medicine chest and renewed twice a year. This is especially necessary in regard to homes that are not within easy reach of a dispensary, so that calm and cool action can be taken in times of emergency.

The list is arranged in alphabetical order with doses according to age :

Drug.	Uses.	Dose under 1 year.	Dose 2 years.	Dose 3-5 years.
Alum . .	Astringent; useful as a gargle in sore throat and as a lotion in "whites" and blepharitis. A teaspoonful to a pint of water.	—	—	—
Boric powder .	A mild antiseptic powder. Most useful for any bruised or sore surface. As a lotion, use a teaspoonful to a pint of hot water.	—	—	—
Brandy . .	Often acts like a charm in stopping the pain of colic	℥ 5-10	℥ 10-20	℥ 20-30
Bromide of potassium.	Calms the nervous system. Ten grains may be injected into the rectum in two tablespoonfuls of water in convulsions. Five grains of chloral hydrate may be added	grs. 1-3	grs. 3-5	grs. 5-8
Calomel . .	A preparation of mercury. A most useful aperient in indigestion and for bilious attacks. It acts on the liver and the small bowel	grs. $\frac{1}{10}$ - $\frac{1}{4}$	grs. $\frac{1}{4}$ -1	grs. $\frac{1}{2}$ -2
Castor oil .	A very good aperient to clear out the bowel in indigestion. It should not be used in constipation	1 dr.	1-2 dr.	1-4 dr.

Drug.	Uses.	Dose under 1 year.	Dose 2 years.	Dose 3-5 years.
Cod-liver oil .	In a 50 per cent. emulsion, may be added to the diet of babies from second or third month, to supply fat and vitamins A and D .	—	—	—
Dill water .	Should be always stocked in the nursery. Most useful for colic and flatulence and to give medicines in .	1-2 dr.	½ oz.	1 oz.
Dover's powder	Acts as a sedative in diarrhoea. Contains opium and should therefore be given cautiously to infants .	½-¾ gr.	* ½ gr.	1-2 grs.
Epsom salts .	A saline aperient. Contained in the aperient mixture .	5 grs.	10 grs.	15 grs.
Ferri et Ammon. cit. (citrate of iron and ammonium).	Useful for babies after six months. To introduce iron into the system in anæmia. A dried milk powder (Hemolac) is now obtainable and contains iron in sufficient quantity for feeding in these cases .	½ gr.	1 gr.	3 grs.
Frjar's balsam .	Used to medicate steam as an inhalation in nose and throat affections. Also to paint over small cuts and abrasions and sore nipples .	—	—	—
Grey powder .	Contains mercury. A mild aperient taken well by infants, and most useful in fevers and to complete the action of santonin; also in jaundice of the new-born .	½ gr.	1 gr.	1-2 grs.
Iodine, tincture of.	A very handy all-round antiseptic for the skin and to reduce chronic swellings .	—	—	—
Ipecac, wine of	A safe drug to induce vomiting in infants .	½ dr.	1 dr.	1 dr.
Laudanum (tincture of opium), 15 ℥ contain 1 gr. of opium.	Also used for false croup, and in cough to induce expectoration . Useful as a last resort in colic. To be used with great caution and only by the doctor's orders, as children are easily poisoned by it. As an injection into the rectum in dysentery, laudanum stops the straining. Four drops for an infant under one year and ten drops for a child of three may be added to a tablespoonful of arrowroot or rice congee, and then injected .	℥ 3	℥ 5	℥ 8
Lime water .	Used to dilute milk in diarrhoea from indigestion of the curd of cow's milk. Not much recommended nowadays, as it is supposed to favour calcium soap stools and help putrefactive processes .	℥ ½* to 1	℥ 1	℥ 2-3
Milk of magnesia.	A good mild aperient for routine use in constipation (q.v.) .	—	—	—
Mustard .	An important household remedy for poultices in inflammation of the chest, and for baths in collapse .	℥ 10	½ dr.	1 dr.
		—	—	—

* To administer ½ drop, add 1 drop to six teaspoonfuls of water, and then give a teaspoonful of this.

Drug.	Uses.	Dose under 1 year.	Dose 2 years.	Dose 3-5 years.
Olive oil . .	Useful as a sedative in burns, and for injection in colic and constipation. Half an ounce is sufficient for the latter purpose.	—	—	—
Paregoric . .	A sedative during teething; the most useful routine drug for whooping-cough. Contains one grain of opium in half an ounce.	—	—	—
Peppermint water.	Relieves pain in flatulence, and useful for making up such a mixture.	$\frac{1}{2}$ dr.	2 dr.	4 dr.
Potassium citrate (citrate of potash).	A white powder. Useful in fever to promote sweating, and to make the urine alkaline in inflammation of the kidney. Added to cow's milk (grs. 1 to $\frac{3}{4}$) it breaks up the curd and makes it more digestible.	gr. 1 gr. $\frac{1}{2}$	grs. 2 grs. 1-2	grs. 5 grs. 2-3
Quinine sulphate.	A specific for malarial fever . .	gr. 1 gr. $\frac{1}{2}$	grs. 2 grs. 1-2	grs. 5 grs. 2-3
Rhubarb, powdered.	A mild aperient in indigestion. Acts as a tonic to the stomach.	grs. 2	grs. 4	grs. 5
Rhubarb, compound powder of (Gregory's powder).	Used in the same way as the simple powder	grs. 3	grs. 5-10	grs. 10-20
Rhubarb and soda mixture.	Acts as a tonic to the stomach after indigestion	—	$\frac{1}{2}$ -1 dr.	1-2 dr.
Sal volatile . .	Useful when baby cries from flatulence, and as a stimulant in fainting. Locally, it soothes the bites of insects	\mathfrak{M} 3	\mathfrak{M} 5-10	\mathfrak{M} 10-20
Santonin. . .	A specific remedy for worms. Combine with calomel and soda.	gr. $\frac{1}{2}$	gr. $\frac{1}{2}$	gr. $\frac{1}{2}$
Senna leaves . .	A mild aperient. Can be used for long periods. An ounce infused for one hour in a pint of hot water and strained . . .	—	$\frac{1}{2}$ oz.	$\frac{1}{2}$ oz.
Smelling salts .	Useful to allay the spasm in stridorous breathing; also in reviving breathing after a fainting attack or suffocation by drowning, and in opium poisoning.	—	—	—
Sodium bicarbonate.	Given in vomiting and for headache from dyspepsia . . .	grs. 2	grs. 3	grs. 5-10
Sodium sulphate (Glauber's salts).	A useful aperient in combination with Epsom salts	—	$\frac{1}{2}$ dr.	1 dr.
Starch powder	Used in a thin solution for sore buttocks.	—	—	—
Turpentine, spirits of.	Only used externally, to sprinkle on hot flannel in fomentations; also to medicate steam inhalations in the feeling of tightness across the forehead in colds.	—	—	—
T.C.P. . . .	A most useful antiseptic for all injuries. May be applied as a wet dressing	—	—	—

Table of Weights and Measures

This table is given to enable you to calculate doses not given above. The usual rule is to divide the age in years by the age plus 12. Thus, for a child of three years of age, the dose will be $\frac{3}{3+12} = \frac{1}{5}$ the adult dose. Under six months give $\frac{1}{20}$ of the dose; and from six months to one year $\frac{1}{15}$ of the dose.

In the case of certain drugs, however, like calomel, belladonna, and arsenic, children can tolerate quite large doses.

Measurements carried out by means of teaspoons and tablespoons are not accurate and may give rise to great error. A teaspoon is supposed to hold one drachm, but the quantity may be more or less than this, depending on the size of the spoon and the substance that is measured. For instance, an average-sized level teaspoonful of sugar weighs nearly $1\frac{1}{2}$ drachms. So also with a fluid, for if condensed milk is poured into a teaspoon, the teaspoon will hold about two drachms.

A tablespoon is said to contain half an ounce, but this again is incorrect as tablespoons vary much in size.

In the case of fluids, at any rate, it is best to buy an ounce glass measure which is easily procurable.

CHAPTER VII

SOME USEFUL PRESCRIPTIONS

THE doses in these formulæ are suitable for a child of one year. They must be altered to suit the age of the child in accordance with the directions in the previous chapter (see Table of Weights and Measures, p. 239).

1. *Saline Aperient Mixture*

Epsom salts	5 grains
Sodium sulphate	2 grains
Chloride of sodium	2 grains
Dilute sulphuric acid	1 drop
Syrup of ginger	5 drops
Peppermint water	to 1 drachm

A teaspoonful three times a day.

2. *Simple Fever or Diaphoretic Mixture*

Solution of acetate of ammonium	15 drops
Potassium citrate	5 grains
Sweet spirits of nitre	5 drops
Wine of ipecac	2½ drops
Syrup of squills	5 drops
Camphor water	to 1 drachm

A teaspoonful three times a day.

Half a grain of carbonate of ammonium and 2 grains

of iodide of potassium may be added to the mixture if the cough is very dry and irritating, and the syrup of orange substituted for syrup of squills.

3. *Asthma Mixture*

Carbonate of ammonium	.	.	.	$\frac{1}{2}$ grain
Iodide of potassium	.	.	.	1 grain
Sal volatile	.	.	.	$2\frac{1}{2}$ drops
Tincture of stramonium	.	.	.	$2\frac{1}{2}$ drops
Syrup of orange	.	.	.	10 drops
Chloroform water	.	.	.	to 1 drachm

A teaspoonful every six hours.

4. *For Bronchitis when there is Much Secretion*

Tincture of belladonna	.	.	.	4 drops
Honey of squills	.	.	.	6 drops
Sal volatile	.	.	.	10 drops
Compound infusion of gentian	.	.	.	to 1 drachm

A teaspoonful every four or six hours.

5. *Bismuth and Soda Mixture for Gastric Flatulence*

Carbonate of bismuth	.	.	.	3 grains
Bicarbonate of soda	.	.	.	2 grains
Compound powder of tragacanth	.	.	.	2 grains
Syrup of orange	.	.	.	5 drops
Dill water	.	.	.	ad 1 drachm

A teaspoonful three times a day.

6. *Carminative Mixture for relieving Abdominal Pain in Flatulence*

Carbonate of magnesium . . .	2 grains
Compound tincture of cardamoms . . .	5 drops
Spirits of chloroform . . .	1 drop
Glycerine . . .	5 drops
Dill water . . .	to 1 drachm

A teaspoonful a few minutes before the feed.

7. *Rhubarb and Soda Mixture for Indigestion*

Rhubarb powder . . .	1 grain
Bicarbonate of soda . . .	2 grains
Tincture of nux vomica . . .	2 drops
Syrup of ginger . . .	7 drops
Peppermint water . . .	to 1 drachm

A teaspoonful three times a day

8. *Soda and Gentian Mixture for Loss of Appetite*

Bicarbonate of soda . . .	2 grains
Sal volatile . . .	5 drops
Compound infusion of gentian . . .	15 drops
Chloroform water . . .	to 1 drachm

A teaspoonful three times a day before meals.

9. *Mixture of Chloral and Bromide*

Chloral hydratis . . .	2 grains
Bromide of ammonium . . .	5 grain
Sal volatile . . .	5 drops

Syrup of orange	6 drops
Chloroform water	to 1 drachm

A teaspoonful every six hours on the first day.

Reduce the dose to half on the second day.

10. *Rheumatic Mixture (for a Child of Five Years)*

Salicylate of soda	5 grains
Bicarbonate of soda	10 grains
Fluid extract of liquorice	3 drops
Syrup of orange	5 drops
Chloroform water	to 1 drachm

A teaspoonful every two hours (see Part III, Chap. III, Rheumatism).

11. *Castor Oil Mixture*

Castor oil	10 drops
Tincture of rhubarb	5 drops
Glycerine	5 drops
Mucilage of acacia	as much as is necessary
Peppermint water	to 1 drachm

A teaspoonful every six hours.

12. *Mixture of Quinine Salicylate*

Ammoniated tincture of quinine	5 drops
Salicylate of soda	1½ grains
Glycerine	6 drops
Peppermint water	to 1 drachm

A teaspoonful every four or six hours.

18. *Mixture of Belladonna and Paregoric*

Wine of ipecac	. . . . .	5 drops
Paregoric	. . . . .	5 drops
Tincture of belladonna	. . . . .	6 drops
Chloroform water	. . . . .	to 1 drachm

A teaspoonful every six hours.

14. *Mixture of Bromide and Belladonna*

Bromide of soda	. . . . .	1 grain
Tincture of belladonna	. . . . .	5 drops
Syrup of tolu	. . . . .	5 drops
Chloroform water	. . . . .	to 1 drachm

A teaspoonful every four or six hours.

15

Calomel	. . . . .	$\frac{1}{2}$ grain
Bicarbonate of soda	. . . . .	5 grains

One powder every second hour.

16

Grey powder	. . . . .	$\frac{1}{2}$ grain
Rhubarb in powder	. . . . .	2 grains
Carbonate of soda	. . . . .	2 grains

One powder twice a day.

17

Santonin	. . . . .	$\frac{1}{2}$ grain
Compound powder of scammony	. . . . .	2 grains
Calomel	. . . . .	$\frac{1}{2}$ grain

To be given at bed-time and repeated in the morning.

18. *Evaporating Lotion* .

Solution of ammonium acetate	.	.	.	.	1 ounce
Rectified spirits .	.	.	.	.	1 ounce
Camphor water .	.	.	.	.	8 ounces

19

Oxychloride of bismuth	.	.	.	.	5 grains
Soft paraffin	.	.	.	.	1 ounce

20

Ammoniated mercury	.	.	.	.	5 grains
Vaseline	.	.	.	.	1 ounce

CHAPTER VIII

WHAT TO DO IN CASES OF POISONING AND OTHER EMERGENCIES

Poisoning

ONLY the merest outline is given here such as may guide you in doing the right thing promptly.

The common poisons fall into four groups :

A. Corrosive Poisons.—These act by destroying the mucous lining of the mouth and lips, stomach, and intestinal tract. Their characteristic is the excruciating pain they produce in the abdomen. In this group are included :

- (i) The acids such as acetic acid, and sulphuric acid or oil of vitriol ;
- (ii) The alkalies, like washing soda ;
- (iii) Metallic substances, like mercury.

B. Irritant Poisons such as arsenic and croton^e oil. There is no tendency to destroy the mucous membrane of the mouth and stomach. The symptoms are a constricting pain in the throat, with thirst, vomiting, and purging, excitement, and probably convulsions.

C. Poisons acting on the Nervous System.—The commonest is some preparation of opium which produces drowsiness and deep sleep with contracted pupils.

D. Food poisoning.—This may be produced in many ways :

(i) Food containing acid juices and put up in tin cans may dissolve out lead or tin and set up gastrointestinal irritation.

(ii) Meat and sausages from animals infected by certain micro-organisms may cause giddiness with muscular spasms and drowsiness.

(iii) Flesh and fish food may be tainted, that is undergoing decomposition, because of bacterial growth.

(iv) Certain shell-fish like mussels may in themselves produce a toxin or poison.

Treatment.—1. Your first duty should be to send an urgent summons for the doctor, or take the child to the nearest hospital.

2. Do not get excited, but keep calm and try to get at the nature of the poison, since treatment will vary with that.

3. Before removing the child, or in the interval of awaiting the arrival of the doctor, administer an emetic or antidote as recommended below.

4. Watch by the sufferer till all danger is past.

Emetics and Antidotes.—In cases of poisoning do not stop to think of the best emetic, but use the most readily obtainable. If nothing else is handy, give a draught of tepid water made greasy by oil or soap and introduce your fingers into the throat; a dessert-spoonful of mustard is nearly always to be had and forms a good emetic if mixed in half a tumblerful of warm water: this should be given in a double dose;

common salt is always at hand and a tablespoonful of that can be given in a tumblerful of tepid water, but is not so effective. *Antidotes* act by converting the poison into a harmless substance, or by counteracting its effect on the body. One that can be given in all cases as a counter-poison is wood charcoal ; but it must be washed first and thoroughly powdered to the consistency of flour. Give it in large draughts of water whenever the true antidote is not available.

Other Emergencies

In every emergency, place the child on a bed ; do not get excited and flurried, but calmly decide on what is to be done and do it ; do not take suggestions from others. Loosen all clothing around the neck and waist ; keep the head and shoulders low and the body warm ; do not give stimulants unless there is collapse. Send an urgent summons for the doctor.

Bleeding from Arteries and Veins.—In the former case, the blood is of a bright red colour and spurts out in jets ; blood from the veins is dark and flows in a continuous stream. The bluish lines seen in the skin are veins ; they carry blood to the heart.

Treatment.—If the bleeding is from a vein, apply direct pressure with a handkerchief folded up several times to form a pad, and bind it firmly on the part with another. If it is a limb that is injured, keep it raised. When the bleeding comes from an artery and in spurts, tie a ligature firmly round the limb immediately above the spot. Do not be unduly alarmed if

the child feels faint. That may do good by reducing the bleeding.

Blood Coughed or Vomited.—Keep the child quiet in bed and give little bits of ice to suck or sips of cold water. *Do not give stimulants* or food.

Bones Broken or "Put out."—Place the injured limb as gently as possible on a pillow. If the child is to be conveyed at all, improvise two splints by padding a couple of sticks with cotton or some handkerchiefs, and apply them to the broken limb with a bandage.

Burns and Scalds.—"A severe burn in a young child is one of life's catastrophes," for we are prone to take too hopeful a view of the case if shock does not kill the little patient on the first day. But often fever sets in about the third or fourth day with delirium and unconsciousness when all seemed going on well, and death supervenes against all expectation. All children, therefore, must be taught to avoid fire from their youngest years. Inquisitiveness, too, is the source of many a tragedy, for the pulling over of a pot of hot tea or the steam from a boiling kettle are often the cause of these accidents.

Treatment.—Keep quite calm and collected. If you see a child's clothes take fire, remember to quickly wrap the young sufferer in some article such as a rug or blanket for the fire cannot be kept up without air. Or if your own clothes catch fire, throw yourself on the floor and roll over and over. The doctor must always be summoned. Place the child immediately in a warm alkaline bath (see Chap. II) with such clothes on as are adherent to the skin; or smear the burnt area with

olive oil, and wrap the little one in flannel to preserve its warmth. Give stimulants owing to the great pain and the shock.

The efforts of the medical man must be directed to the combat of the shock, which is best done by injecting a 2 per cent. solution of glucose in normal saline under the skin or into the rectum, and giving glucose water as drinks. Fraser * states that the administration of alkalies should never be omitted and recommends giving twenty to thirty grains of the alkaline sodium phosphate every four hours by mouth, or in a 5 per cent. solution by rectum. Hexamine by the bowel is supposed to be especially useful. The *local* treatment consists in keeping the part dry and aseptic and preventing the absorption of septic products. The coagulating method of treatment by spraying the burnt area with a 2·5 per cent. watery solution of tannic acid, after cutting off the skin of any blisters that have formed, is one of the easiest and most successful of the modern methods of treating burns; another is the protective method by means of paraffin (ambrine). In this method the blisters are not cut away, but merely punctured to let out the fluid.

Face burns are best treated by continual applications of absolute alcohol.

Small burns or scalds are effectively soothed by a solution of bicarbonate of soda. Soak a piece of lint in this and wrap it round the affected part and cover with oiled silk.

* *B. M. J.* Vol. I, 1927.

Choking is a common accident in children because of their habit of putting marbles, etc., in their mouths. Fish-bones and lumps of meat, too, sometimes get stuck in the throat. Whole lozenges or lumps of crystallized sugar may even choke a young child.

Treatment.—Pass your forefinger into the throat on one side and try to hook out the offending substance; or *invert* the child's head downwards and then tap him briskly on the back. If the foreign material is lodged in the larynx or organ of the voice, these measures will not succeed, and in urgent cases it may be permissible to snick the larynx with a penknife to let in air into the lungs, pending surgical aid. Do not pat a choking child on its back in the way done usually; that can often increase the obstruction by getting the material into the larynx.

Drowning.—In attempts to restore those apparently drowned, place the child on his back, remove all tight clothing, and support the head and shoulders on some of these, folded up, unless a cushion is available. Then open the mouth and draw the tongue forwards, carefully cleansing the inside of the mouth and the nostrils. Keep the tongue held forwards and try to restore breathing by Sylvester's method of artificial respiration. Repeat the movements steadily eighteen times a minute until a breath is taken spontaneously. Then induce warmth by friction and blankets. Stimulate the nostrils by means of smelling salts. When swallowing is possible warm brandy and water or coffee may be given. Encourage any tendency to sleep. Apply

mustard poultices to the chest and back if the breathing appears difficult.

Fainting.—Any trifling cause may be responsible, such as a stifling atmosphere, hunger, the sight of blood, etc. The faint is produced because a sufficient supply of blood to the brain has been suddenly withheld. Therefore in all cases place the little patient flat on the back without a pillow; in fact, the head may be kept lower than the rest of the body. Loosen all tight clothing about the neck and waist and dash cold water over the face. Hold some smelling salts to the nostrils. When consciousness has returned give some stimulant in small doses.

Fits.—See Convulsions.

Never attempt to force any liquid or stimulant into the mouth of a child who is having a fit of any sort.

Head, Injuries of.—A heavy blow on the head caused in any way, as by the fall of a heavy fruit such as the cocoanut or a tumble from a tree, may injure the brain by concussion. There is unconsciousness though not generally so deep that the child cannot be momentarily roused; the breathing is shallow, the face is pale, and the skin cold; the pulse is weak and the pupils are dilated.

Treatment.—Send for medical aid promptly. Keep the child in bed, the foot of which should be slightly raised. Apply warmth to the body by means of blankets and hot-water bottles, but keep the head cool. Loosen all tight clothing.

Mad Dogs, Bites of.—See Bites, Chap. III.

Snake-bites.—There are non-poisonous snakes as well as poisonous ones; but since immediate action is necessary to save life, it is best to take prompt measures without wasting time to establish the species, since everything must be done within ten minutes.

Symptoms.—There are two great classes of poisonous snakes known as the *Colubrines*, of which the cobra is a type, and the *viperines* to which Russell's viper—the polonga—belongs. The poisonous symptoms being different in the two types, they will be described separately :

(i) *The Colubrines.*—There is burning pain for a short time only and a feeling of numbness which spreads up the limb. Speech is affected; there is a staggering gait and widespread paralysis soon sets in. The breathing is especially affected and becomes rapid and shallow, and finally ceases. The heart, however, continues to beat for some time longer.

(ii) *The Viperines.*—The pain at the site of the bite is great and persistent and there is a continuous oozing of blood from the wound. This is a most characteristic symptom. If any of the poison enters a vein directly, there is widespread clotting of the blood in the body.

Treatment.—Apply a ligature *at once* above the bite, that is on the side nearest the heart. Rubber tubing is the best form of ligature as thereby even pressure can be maintained. If it is a finger or toe that has been bitten, amputate it. This must be done within ten minutes or not at all in the case of the colubrines. Open up the wound and rub in crystals of zinc or

potassium permanganate. This will neutralize any poison it comes into contact with, but is not sufficient to save life. Inject *antivenene*, if available—up to 150 c.c. for a cobra bite, 100–400 c.c. for the bite of a viper. If serum has been injected and yet breathing has ceased, artificial respiration in the case of a cobra-bite will give time for the serum to act and may thus save life.

Sprains are caused by strain on, or rupture of, muscular and tendinous structures. There is pain and swelling of the part with a limitation in the movements of the neighbouring joint.

Treatment.—Bathing with hot sea water gives great relief; or apply lint soaked in an evaporating lotion (see Chap. VII) continuously. The part must be kept absolutely at rest for a few days with the muscles relaxed. When the pain and swelling have subsided to some extent, undertake gentle rubbing, with passive movements of the joints; firmly strap and bandage the joint in the intervals. It is always best to consult the doctor, after a couple of days at any rate, to make sure that fragments of bone have not been torn off.

Swallowing of Pins and Needles.—Purgatives should on no account be given. Keep the child on a dry diet of bread, eggs, potatoes, etc. Needles, splinters of wood, and thorns sometimes get embedded in the flesh and must be drawn off. It is wise to have them cut down upon and the wound disinfected afterwards. If they cannot be felt, they should be located under the X-rays.

CHAPTER IX

NURSING RECIPES

1. *Albumen Water*

PLACE the white of an egg in a tea-cup and fill up with cold water and thoroughly mix. By first cutting into the white with a clean pair of scissors, you will be able to mix it better. Add sugar to taste and flavour with orange juice. If lumpy, strain through muslin.

A very useful temporary food when there is some digestive trouble.

2. *Barley Water*

Mix two level teaspoonfuls of Robinson's "Patent" Barley into a smooth paste with water. Make this up to one pint with boiling water and simmer for five to ten minutes, stirring all the time. Strain through fine muslin. Make up fresh twice a day.

Barley water is a useful diluent for cow's milk, as it prevents the formation of clots in the stomach. It may also be used as a temporary food in any digestive upset after the sixth month.

3. *Rice Water*

Soak four heaped tablespoonfuls of well washed raw rice in two pints of cold water for a couple of hours.

Allow to simmer on the oven for one hour and strain off the liquid. When cool, flavour with chips of orange peel or cinnamon.

A useful temporary food in diarrhoea ; may be thus used instead of barley water.

4. *Toast Water*

The crust of a slice of bread, toasted hard, is placed in a jug and a pint of cold water added. Stand aside for one hour. Strain off the clear brown liquid.

A useful drink in fevers and diarrhoea.

5. *Lemonade*

Peel off the rind of a lemon and squeeze the juice into a jar. Pound up the rind and add it to the juice. Pour a pint of boiling water in. Add four ounces of sugar, mix, and strain. Keep to cool.

A useful drink in fevers.

6. *Albumin or Protein Milk*

The superior usefulness of protein milk in certain disorders of nutrition lies in the fact that it is milk rich in protein and poor in fat and sugar. The simplest way of preparing it is by the use of Mead Johnson & Co.'s tablets of calcium caseinate or "casec," if obtainable. Twenty grains may be added to an ounce of milk for children over three months old.

Milk that is rich in protein and poor in fat can also be conveniently prepared by keeping milk to stand for three hours in a bottle or narrow cylindrical vessel and

adding to the "bottom" milk, albulactin or plasmon, in the same proportion, discarding "the top" milk which contains most of the fat or cream.

7. *Whey*

Heat a pint of fresh cow's milk in a saucepan till just warm, about 100° F. Pour into a wide bowl and add a teaspoonful of essence of rennet. Stir well and stand aside for half an hour. A firm clot or curd will have formed. Cut this up with a knife and strain the light yellow liquid that exudes from the mass through a piece of muslin that has been previously boiled and dried. This liquid is the whey and contains very little protein and fat and about 4 per cent. of sugar. Maximum amount per feed 3½ ounces. Whey may be pasteurized and then milk added, from the top or lower down according to the amount of fat required, or raw beef juice, to increase the protein content.

A useful food in certain cases of weak digestion.

8. *White Wine Whey*

Heat half a pint of fresh cow's milk in a saucepan on a stove till it just begins to boil. Now remove from the fire and add 2½ ounces of cooking sherry; boil up again. Stand aside on a table for three minutes. Strain through muslin, as before, that has been previously boiled and dried. It contains 2 per cent. alcohol with a very little protein and some sugar.

A very useful emergency food to tide over a difficult period of curd indigestion when there is much vomiting;

also as a stepping-stone to the resuming of milk-feeding after an attack of infantile diarrhoea. Should not be continued by itself for more than two or three days, and in amounts not to exceed two ounces every two hours. .

9. *Butter-milk and Acidified Milk*

Butter-milk is made by sterilizing a pint of cow's milk by boiling and adding to it a culture of lactic acid bacilli. The milk is then put aside in an incubator for from six to twelve hours and is ready for use. The product is a milk of high acidity which does not form a tough casein curd in the stomach but passes quickly into the intestine; some sugar is lost in the process of fermentation by the bacilli. If it has been prepared from skimmed milk, the fat content is very low, so that it forms a suitable food for premature infants and in cases of diarrhoea with foul-smelling motions, the result of putrefactive action in the bowel.

The same result may be achieved by using *acidified milk*. A pint of fresh milk is sterilized by boiling and then cooled. A drachm of chemically pure lactic acid is then added drop by drop, the milk being stirred vigorously to prevent curdling. The product is slightly acid and is highly antibactericidal.* It may be used just as is plain milk, with added sugar. When lactic acid is not available, the same result may be obtained by adding five drachms of lemon juice to the pint of milk. A lactic acid milk powder known as *lacidac*, is now

* Wilcox, *Clinical Pediatrics*, 1928.

available in Ceylon in two strengths of 1 per cent. and 16 per cent. fat. The feed is prepared by simple dilution with water as in other dried milk preparations.

10. *Butter-flour Mixture*

This is a mixture that is high in fat and carbohydrates, but low in protein, and yet easily digested, because of the changes induced in each ingredient in the process of making. Three level tablespoonfuls of butter are heated in a frying-pan for five minutes. Five tablespoonfuls of flour are added and the heating continued till the mixture turns brown and liquid. Stir all the time. Add a pint of water in which two level tablespoonfuls of cane sugar have been dissolved. Boil for twenty minutes. Add a third of the volume of boiled milk. This contains 6 per cent. fat, 9 per cent. carbohydrate, and 2 per cent. protein.*

Useful for ill-nourished children when concentrated feeding is needed, and largely used by Meyer, of Berlin, with success.

11. *Peptonized Milk*

This is partially digested milk. To one pint of a mixture of milk and water warmed to 100° F. (that is, just warm), add a cupful of Fairchild's peptogenic milk powder, which can be obtained from the chemist. Allow this to act for ten or fifteen minutes and quickly heat to boiling point. The product is a milk mixture fairly similar to human milk.

* Wilcox, *Clinical Pediatrics*, Vol. IX.

Useful in cases of weak digestion to tide over a difficult period. Do not employ this method in the food disturbances described under Nutritional Disorders.

12. *Linseed Tea*

Take a tablespoonful of whole linseed (not linseed meal), a dessertspoonful of liquorice root, and a tablespoonful of fine crush sugar. Place in a jug and pour in a pint of boiling water. Stand the jug on the side of the stove for four hours where the water will be kept hot but will not boil. Cool, pour off the clear liquid, and flavour with lemon juice.

A very soothing drink in chest colds. Should be drunk warm.

13. *Beef Essence*

Take a quarter pound of beef, remove all skin and fat, and mince it very fine. Place in a common earthenware pot with half a pint of cold water, put on the lid, and tie a piece of brown paper over it. Stand the pot in a saucepan of cold water and heat the latter to boiling point. Allow to simmer for three hours. Before drinking, add salt to taste.

A useful digestive and nutritive stimulant.

14. *Beef Juice*

Slightly broil a quarter pound of perfectly fresh round steak. Cut into small pieces and press in a clean lemon squeezer.

Useful in malnutrition when added, a teaspoonful at a time, to other feedings.

15. *Gruels, Plain and Dextrinized*

Take a good tablespoonful of a cereal flour, add to it a pinch of salt, and mix well with a little cold water into a very smooth paste, thick as cream. Add to this a pint of water (or milk, if preferred), and bring to the boil in an enamelled saucepan or double boiler, with constant stirring. This causes the flour to swell up. Allow to simmer for ten minutes. Strain through a fine wire strainer and make up to one pint. Or, if the gruel is to be dextrinized, place the saucepan in cold water to cool the contents and then add a teaspoonful of the ferment liquid taka-diastase (P. D. & Co.), which can be obtained from the chemist, and stir. The gruel will become thinner as the starch goes into solution and becomes digestible. Make up to one pint and keep on ice till used. Sugar may be added to taste.

Gruels are useful additions to the milk in infant feeding, when it is desired to increase the carbohydrate content.

16. *Vegetable Broth*

Break up a pound of tender beef or chicken bones ; place in a jar, add a pinch of salt and about two pints of water, sufficient to immerse them. Allow to simmer by the side of the stove till soft. Slice up some vegetables such as cabbage, carrots, spinach, and ladies' fingers, and add them to the contents of the jar. Allow to simmer for another hour. Strain through a fine sieve. When this sets into a jelly, one or two table-

spoonfuls can be given at a meal as an extra. It will keep till the next day.

17. *Milk Jelly*

Pour a pint of boiling milk into a bowl containing a tablespoonful of gelatine. Stir till the latter dissolves. Flavour with lemon peel and add dextrinized gruel or Mellin's food to thicken it. Add sugar to taste and allow to set.

18. *Junket*

Add a teaspoonful of essence of rennet to half a pint of warm milk. Stir well and keep aside till firmly set.

A useful addition to a meal after the first year of life.

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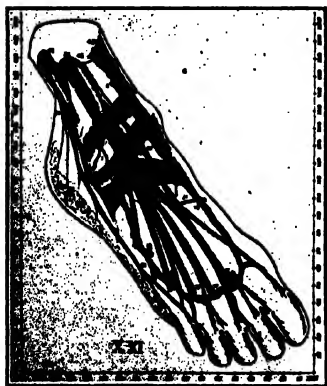
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